

Bering Sea – Aleutian Islands State-Managed Groundfish Fisheries, and  
Groundfish Harvest From State Waters Under Federal Management  
Annual Management Report, 1999

By

Robert Gish

Regional Information Report<sup>1</sup> No. 4K00-64

Alaska Department of Fish and Game  
Division of Commercial Fisheries  
211 Mission Road  
Kodiak, AK 99615

November 2000

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## ABSTRACT

The Alaska Department of Fish and Game manages fisheries for sablefish *Anoplopoma fimbria* and black rockfish *Sebastes melanops* in state waters of the Aleutian Islands Area. Waters of the State of Alaska are from 0 to 3 nautical miles offshore. This report summarizes management of these fisheries during the 1999 season, and the harvest in these fisheries since their inception, 1995 for sablefish and 1994 for black rockfish.

Federally-managed groundfish fisheries also occur in state waters. This report summarizes the harvest from state waters in those fisheries from 1995 through 1999.

## INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) manages three groundfish fisheries in the state waters of the Bering Sea – Aleutian Islands (BSAI) Area (Figure 1) and the South Alaska Peninsula Area. Those fisheries are sablefish *Anoplopoma fimbria*, black rockfish *Sebastes melanops* and Pacific cod *Gadus macrocephalus*. Waters under the jurisdiction of the State of Alaska are from 0 to 3 nautical miles offshore. This report describes the sablefish and black rockfish fisheries. The ADF&G Regional Informational Report Number (in press) covers the state-managed Pacific cod fishery that occurs in a portion of this area.

The National Marine Fisheries Service (NMFS) manages other groundfish fisheries in the BSAI Area, including state waters. The ADF&G issues on an annual basis a “global emergency order” which applies to those other groundfish fisheries. This global emergency order (EO) modifies the commercial groundfish seasons in state waters for those fisheries not managed by the State of Alaska to coincide with federal fisheries in waters of the adjacent Exclusive Economic Zone (EEZ), 3 to 200 nautical miles offshore. This report summarizes the harvest of groundfish from state waters of the BSAI Area in those federally-managed fisheries from 1995 to 1999.

## ALEUTIAN ISLANDS STATE-WATERS SABLEFISH FISHERY

### *Introduction*

In 1995 the National Marine Fisheries Service (NMFS) implemented an Individual Fishing Quota (IFQ) system for the harvest of sablefish in federal waters. This system did not account for a portion of the historical harvest of sablefish that came from the state waters of Alaska. The Alaska Department of Law advised that the harvest of sablefish in the state waters of Alaska could not be limited to only IFQ permit holders, therefore any holder of a valid Commercial Fisheries Entry Commission (CFEC) interim use permit for statewide sablefish could participate. A fishery for sablefish was established in areas of the state where the historical harvest of this species was of sufficient quantity to allow for a manageable fishery. The Aleutian Islands Area (as defined below) is the only area in the Westward Region a state-managed fishery could be established.

### *Description of Area*

The Aleutian Islands Area for state-waters sablefish fishery management (Figure 2) encompasses all state waters of the Bering Sea south of the latitude of Cape Sarichef (54° 36' North latitude), and of the Pacific Ocean west of the longitude of Scotch Cap Light (164° 44' West longitude). This area includes all of the state groundfish registration area of the Bering Sea - Aleutian Islands Area south of Cape Sarichef and part of the South Alaska Peninsula Area from Scotch Cap Light to 170° West longitude (Figure 3). This area is adjacent to the federal Aleutian Islands Sablefish Regulatory Area, the Bering Sea Sablefish Regulatory Area south of Cape Sarichef, and the Western Gulf of Alaska Sablefish Regulatory west of Scotch Cap Light.

### *Fishery History*

The Alaska Department of Fish and Game established March 15 as the opening date and November 15 as the closing date for this new fishery, unless the guideline harvest level (GHL) was obtained and the fishery was closed earlier by emergency order (EO). The GHL, or harvest quota, was to be set according to recent state waters harvest history, and the fishery was to be managed so that the catch did not exceed the established GHL.

The 1995 sablefish fishery in state waters of the Aleutian Islands opened concurrent with the IFQ fishery in federal waters. A harvest quota of 400,000 pounds was established for sablefish in the Aleutian Islands registration area for the 1995 season. The quota was based on the average harvest from this area during the previous four years. The first delivery and greatest number of deliveries occurred in May. Fishing effort, in terms of deliveries per month, remained relatively constant from June to the regulatory closure on November 15. Most of the effort in this fishery occurs in conjunction with the Greenland turbot *Reinhardtius hippoglossoides* fishery, and with the IFQ Pacific halibut *Hippoglossus stenolepis* and sablefish fisheries. A total of 37 vessels made 61 deliveries for a season harvest of 272,320 round pounds (Table 1). Average exvessel price in Dutch Harbor was \$2.96 per pound dressed weight; the estimated total value for the 1995 state-waters sablefish fishery was over \$500,000. Eight non-quota vessels made 29 deliveries for 111,862 pounds, or 41% of the harvest. There were 29 IFQ or Community Development Quota (CDQ) vessels that made 32 deliveries for a total of 160,458 pounds, or 59% of the harvest. Two catcher-processors participated in the fishery, both of which had IFQ shares.

A harvest range of 270,000 to 300,000 pounds was announced for the 1996 season based on the 1995 NMFS survey which showed sablefish stock reductions in the Bering Sea, Aleutian Islands and Western Gulf of Alaska federal regulatory areas. A quota of 280,000 pounds was subsequently established during the season. Fishing effort started immediately and the first deliveries occurred in late March. Effort increased during the 1996 season in both harvest and deliveries per month as compared to 1995. The fishery was closed by emergency order on July 26. At that time 24 vessels had made 48 deliveries and harvested 294,384 round pounds. Subsequent to the closure 11 additional vessels made landings containing sablefish harvested from state waters. Eight of the vessels possessed IFQ or CDQ permits. The total state waters harvest of sablefish in 1996 was 401,328 pounds; a total of 35 vessels made 67 deliveries in 1996. Average exvessel price per pound in Dutch Harbor was \$2.54 dressed weight; the estimated fishery value of all state waters activity was \$642,000. Nine non-quota vessels made

32 deliveries for a harvest of 203,844 pounds. This represents 51% of the total harvest. There were 26 IFQ or CDQ vessels that participated in the fishery; they made 35 deliveries for 197,484 pounds, or 49% of the harvest. Five catcher-processors participated in the fishery, two of which had IFQ shares.

In 1997 the department issued a news release on March 12 notifying all fishermen of the registration requirements necessary to participate in the state-waters sablefish fishery. A harvest quota of 270,000 pounds was established for the 1997 season. The quota was based in part on the 1996 NMFS survey, which showed no improvement in stock abundance. The reduction of 10,000 pounds was to adjust the state waters quota to reflect the same percentage decrease as in the federal quota since the 1995 season. The first delivery occurred in April, the greatest vessel participation was in May, and the most deliveries were in July. The 1997 fishery was closed by EO on July 20. Thirty-two vessels had made 58 deliveries and harvested 278,906 pounds. Subsequent to the closure nine IFQ vessels and one CDQ vessel made deliveries that contained sablefish harvested from state waters. The total 1997 sablefish fishery in state waters had 39 unique vessels, which made 75 deliveries for a harvest of 317,408 pounds. Average exvessel price per pound in Dutch Harbor was \$3.55 dressed weight; estimated fishery value for all state waters activity was \$710,000. Twenty non-quota vessels made 48 deliveries for 180,859 pounds, or 57% of the harvest. There were 19 IFQ or CDQ vessels that made 27 deliveries for a total of 136,549 pounds, or 43% of the harvest. Three catcher-processors participated in the fishery, two of which had IFQ shares.

The department issued a news release on March 12, 1998 notifying all fishermen of the registration requirements necessary to fish for sablefish in state waters. All area processors were contacted by department personnel and were requested to remind fishermen to register. Also, NMFS personnel in Dutch Harbor advised fishermen to contact ADF&G regarding sablefish registration for state waters. The harvest quota for 1998 was 270,000 pounds, the same as for the 1997 season. The quota for the Bering Sea and Aleutian Islands federal regulatory areas increased by 16 percent. However, the department did not increase the quota in state waters to help mitigate the over harvest, primarily by IFQ vessels, which occurred during the previous two seasons. Effort started in March, harvest peaked in August, and the fishery closed by regulation on November 15. A total of 38 vessels made 101 deliveries and harvested 254,348 round pounds during the fishery. Average exvessel price per pound in Dutch Harbor was \$2.18 dressed weight; estimated fishery value was \$350,000. The 1998 harvest, and the exvessel and fishery values, are the lowest recorded in the four year history of this fishery. Factors contributing to the lower performance could be the reduced effort toward Greenland turbot in the Aleutian Islands, the low exvessel value of both sablefish and Pacific halibut, and the economically depressed Asian market. Twenty-six non-quota vessels participated in the fishery, and they made 84 deliveries. The non-quota vessels delivered 160,490 pounds, which was 63% of the harvest. Twelve IFQ or CDQ vessels participated in the fishery and they made 17 deliveries. The IFQ or CDQ vessels delivered 93,858 pounds, or 37% of the harvest. Two catcher-processors participated in the fishery, both of which had IFQ shares.



### ***1999 Fishery***

For the 1999 sablefish fishery, ADF&G issued a news release on March 12 to announce the GHL of 250,000 pounds and to inform all fishermen of the registration requirements. The federal total allowable catch (TAC) for the Bering Sea and Aleutian Islands federal regulatory areas increased slightly for 1999; however, the department decreased the 1999 GHL for state waters due to poor fishery performance in 1998. All area processors were contacted by department personnel and were requested to remind fishermen to register, and NMFS personnel in Dutch Harbor advised fishermen to contact ADF&G regarding sablefish registration for state waters.

The first delivery and highest number of deliveries occurred in May, and the harvest peaked in June (Figure 4). The fishery was closed by EO on August 16, with a harvest of 249,017 pounds. Subsequent to the closure 11 additional deliveries containing sablefish harvested from state waters occurred. This harvest came from quota share fishers, primarily from CDQ fishers. A total of 23 vessels made 37 deliveries and harvested 279,649 round pounds during the 1999 fishery (Table 1). Average exvessel price per pound in Dutch Harbor was \$2.69 dressed weight; estimated fishery value was \$474,000.

The increase in fishery performance in 1999 may be due to increased participation by experienced IFQ or CDQ sablefish fishers and to longer trips. The number of non-quota vessels and deliveries, and the number of total vessels and deliveries decreased significantly, while the number of IFQ or CDQ vessels and deliveries increased (Figure 5). The average of 7,558 pounds per delivery was the highest in this fishery to date. This compares to 4,882 pounds per delivery for the years 1995 through 1997 and 2,518 pounds per delivery in 1998. In 1999, 76% of the deliveries were over 1,000 pounds. This reversed a recent decline in deliveries greater than 1,000 pounds from 68% to 36% for 1996 through 1998. The average trip length in 1999 was twelve days, more than double the average of approximately five days for 1995 through 1998. Seven catcher-processors participated in the 1999 fishery, more than in any other year, and the increase in catcher-processors account for the increased average trip length. Additionally, 61% of the fishers in 1999 had participated in this fishery or in other Aleutian Islands fisheries before, which compares to an average of 50% in prior years. The increase in fishery performance is also reflective of the NMFS survey which showed an increase in sablefish abundance in the last two years.

The harvest came primarily from the Bering Sea side of the Aleutian Islands (Figure 6), which is consistent with previous years' harvest. Areas with the most harvest are the waters north of and adjacent to Unalaska, Umnak, Kasatochi, Great Sitkin, Adak, Kanaga, Bobrof and Tanaga Islands (Figure 7). These waters are the traditional harvest areas observed for this state-waters fishery.

According to anecdotal information from the fleet, the problems encountered with killer whales *Orcinus orca* feeding on hooked sablefish during gear retrieval have continued to increase. All reported whale predation encounters in 1999 were from the eastern part of the Aleutian Islands in the area east of 170° West longitude. The killer whale predation problem and a new processor in Adak may help explain the shift in percentage of the harvest to the area west of that longitude (Figure 8).

The majority of the harvest after the closure was by vessels participating in the Multi-Species CDQ (MS CDQ) Program. Regulations governing the program have mandatory retention requirements for all unobserved vessels as long as there is quota available for that species. This requirement includes sablefish harvested in state waters, and is in direct conflict with state regulations governing closed waters. No legal action regarding closed-water fishing was taken due to the conflicting regulations; fishers were advised that state regulations prevail in the territorial waters of Alaska and further retention of sablefish harvested from state waters would result in a citation. The federal retention regulation will be changed for future fisheries. One IFQ fisher was mistakenly registered to fish state waters after the closure which resulted in one late delivery but no legal action was taken.

Six non-quota and 19 IFQ/CDQ vessels participated in the fishery (two participated first as non-quota and later as quota vessels); they made 9 and 28 deliveries, respectively. Non-IFQ vessels delivered 122,066 pounds, which was 44% of the harvest; IFQ vessels delivered 157,583 pounds, or 56% of the harvest. Seven catcher-processors participated in the fishery. Six of the catcher-processors had IFQ or CDQ shares, a three-fold increase compared to prior years.

### *Summary*

The Aleutian Island state-waters sablefish fishery started in 1995. In the five-year history of this fishery 119 vessels have harvested over 1.5 million pounds, which produced an exvessel fishery value of approximately \$2.7 million. In the Aleutian Islands sablefish fishery through 1999, non-quota fishers accounted for 40% of the fleet, 59% of the deliveries, and 51% of the harvest. Nineteen catcher-processors have participated in this fishery through 1999, thirteen of which had quota shares.

The Aleutian Island state-waters fishery is open to all fishers with valid CFEC interim use permits for statewide sablefish. The requirements for the fishery are registration with the department in Dutch Harbor and adherence to EO closure announcements. There has been a misconception by some CDQ and IFQ fishermen who believe the federal permit allows fishing in state waters without registration and regardless of closures of state waters. Documentation of all violations has been provided to the Department of Public Safety, Division of Fish and Wildlife Protection for further action. The ADF&G and NMFS have increased efforts to educate the fishing fleet about state registration requirements and the Alaska Board of Fisheries will address a sablefish management plan for the Aleutian Islands area during the January 2001 meeting.

### *Status of Stock*

The harvest of sablefish in state waters of the Aleutian Islands has decreased since 1985 from 1.4 million pounds to 290 thousand pounds in 1994. Harvest in the state-managed fishery from 1995 through 1998 has ranged from 401 thousand pounds in 1996 to 254 thousand pounds in 1998. The guideline harvest level has decreased from 400 thousand pounds in 1995 to 250 thousand pounds in 1999.

The National Marine Fisheries Service has conducted annual longline surveys covering portions of the Aleutian Islands sablefish management area since 1978. Initially the survey, which was a

cooperative effort with Japan, covered the Gulf of Alaska; the survey was expanded to include the Aleutian Islands in 1980 and the Eastern Bering Sea in 1982. Results of the surveys through 1994 show a decrease in sablefish abundance from a high in the mid 1980s.

In 1987 NMFS started an independent annual longline survey in the Gulf of Alaska. That survey was expanded to include biennial sampling of the eastern Aleutian Islands in 1996 and the eastern Bering Sea in 1997. The survey, which covers a portion of the state waters fishery management area, shows an increase in abundance since 1997. Sablefish abundance, however, is still well below the levels observed in 1986 and 1987.

## **ALEUTIAN ISLANDS BLACK ROCKFISH FISHERY**

### ***Introduction***

The Alaska Department of Fish and Game established a directed fishery for nearshore pelagic shelf rockfish in state waters of the eastern Aleutian Islands in December of 1994. The pelagic shelf rockfish group includes black, blue *S. mystinus*, widow *S. entomelas*, yellowtail *S. flavidus* and dusky *S. ciliatus* rockfish. In the eastern Aleutian Islands this group is represented by black and dusky rockfish due to the limited distribution of the other species.

The establishment of this fishery was in response to local public inquiries regarding the possibility of a state-managed black rockfish fishery. Under federal management black and other pelagic shelf rockfish were included in the “other rockfish” assemblage. Other rockfish is a large species assemblage of fish that includes all rockfish species in the Bering Sea and Aleutian Islands except shortraker *S. borealis*, rougheye *S. aleutianus*, sharpchin *S. zacentrus* and northern *S. polyspinis* rockfish, and Pacific ocean perch *S. alutus*.

Directed fisheries, in both state and federal waters for the other rockfish assemblage, occurred prior to 1994 but were of progressively shorter duration. The fisheries were open to all gear types, however they were managed as trawl fisheries as the harvest was predominantly by trawl vessels. Black and other pelagic shelf rockfish had become available to the local fleet primarily as bycatch in jig and longline fisheries for other groundfish.

In 1994 the other rockfish assemblage was managed as bycatch-only by the National Marine Fisheries Service (NMFS); through November only 43% of the allowable catch of this assemblage had been taken. According to ADF&G fish ticket data, approximately 4% of that harvest was pelagic shelf rockfish, of which less than 1% was black rockfish.

The department, with notification to NMFS and the North Pacific Fishery Management Council (NPFMC), assumed management authority of nearshore pelagic shelf rockfish for a state-waters fishery by emergency order (EO) on December 21, 1994. Handlines and mechanical jigging machines were stipulated, by news release, as the gear types for this fishery. These gear types have a low level of exploitation that would not threaten to exceed the federal total allowable catch (TAC) for the other rockfish category, and do not have the federal prohibited species bycatch caps of other gear types.

### *Description of Area*

The Aleutian Islands black rockfish management area encompasses all state waters south of the latitude of Cape Sarichef (54°36' North latitude) and west of the longitude of Scotch Cap Light (164°44' West longitude); it also includes federal waters of the EEZ between Scotch Cap Light and 170° West longitude (Figure 9). This management area incorporates waters which are part of the state Bering Sea - Aleutian Islands and South Alaska Peninsula registration areas, and part of the federal Bering Sea, Aleutian Islands and Western Gulf of Alaska regulatory areas (Figure 3).

### *Fishery History*

The Alaska Department of Fish and Game established two areas of harvest in the eastern Aleutian Islands in 1994; the state waters around Unalaska, Sedanka and Unalga Islands, and the state waters around Akutan and Akun Islands. A guideline harvest level (GHL) of 100,000 pounds was established for this fishery, 50,000 pounds from each area. This harvest level was deemed sufficient to demonstrate fishery potential, yet conservative enough to prevent over harvest. A conservative management policy for these slow-growing and long-lived, non-migratory species was considered necessary to prevent overexploitation.

The 1994 fishery opened at noon on December 21; only one vessel registered for the fishery. No harvest of pelagic shelf rockfish occurred in 1994 subsequent to the establishment of the directed fishery.

Fishing effort was minimal and sporadic throughout 1995. Fourteen vessels registered for the fishery. All harvest was as bycatch in the Pacific cod jig fishery. Harvest information is confidential because the actual number of vessels that participated was less than three.

In 1996 landings increased in the Unalaska, Sedanka and Unalga Islands area to a harvest of just over 17,000 pounds (Table 2). Eighteen vessels registered for this fishery; only six vessels made deliveries. The average delivery was just over 1,400 pounds. Average exvessel price per pound in 1996 was \$0.18, for a fishery value of approximately \$3,100. The principal area of harvest was from the waters just north of Unalaska Island. The primary species of harvest was black rockfish; dusky rockfish was also harvested. No effort was reported from the Akutan and Akun Islands area in 1996.

Fishing effort, in terms of number of landings and amount harvested, increased during 1997. The number of participating vessels, however, decreased in 1997. Harvest information by area is confidential due to the low number of vessels participating in each area (Table 3). Both harvest areas are combined for the purpose of this report. Nine vessels registered for the fishery in 1997. Three vessels made 18 landings for a total harvest of 102,746 pounds from the entire area. Average landing for the season was just over 5,700 pounds. Exvessel value averaged \$0.34 per pound during the 1997 fishery, which produced a total fishery value in excess of \$35,000.

Vessels started fishing in April and continued through October; most of the harvest occurred during September and October. The majority of effort took place along the outer coast of

Sedanka Island and just south of Akutan Island. The fishery was closed by emergency order on November 1, 1997.

The total harvest represents both black and dusky rockfish. Analysis of fish ticket data shows dusky rockfish compose 7% of the harvest, however logbook data submitted by one operator showed dusky rockfish contributing 28% of the harvest for that vessel. Area processors were notified of the possible misidentification and asked to provide positive identification of rockfish purchased. Also, the department provided identification information to responsible personnel at those area processors. Through analysis of otoliths obtained from limited dockside sampling in 1997, average age of black rockfish was 17 years; the harvested fish averaged 44 centimeters (cm) in length (Table 4). Dusky rockfish averaged 17 years old and 39 cm in length. All rockfish sampled in 1997 were from the waters around Sedanka Island.

The nearshore rockfish fishery changed with the 1998 season. The area expanded to include all state waters of the Aleutian Islands south of Cape Sarichef and west of Scotch Cap Light, and all federal waters of the Pacific Ocean between Scotch Cap Light (164° 44' West longitude) and 170° West longitude (Figure 9). The Alaska Department of Fish and Game assumed management responsibility for black and blue rockfish in the waters of the Exclusive Economic Zone (EEZ) in the Gulf of Alaska as Amendment 46 to the Groundfish Fishery Management Plan removed those species from the federal plan. Both black and blue rockfish are shallow water nearshore pelagic shelf species that were not well assessed by federal surveys and not well addressed with the current federal management practices. This action limited the directed harvest to only black rockfish in the Aleutian Islands. Blue rockfish have a limited distribution in Alaska and do not occur in the Aleutian Islands. The NMFS retained management authority over the other species of pelagic shelf rockfish (widow, yellowtail and dusky rockfish) in federal waters. This group is fully utilized in the federal fisheries; therefore dusky rockfish could now only be harvested as bycatch in the Aleutian Island rockfish fishery.

As the Aleutian Islands rockfish management area expanded in 1998, a new area of harvest was established by the department; this area encompassed all state waters west of 168° West longitude and federal waters of the Western Gulf of Alaska between 168° and 170° West longitude (Figure 10). The new area was established in response to public interest in a rockfish fishery in the vicinity of Atka Island.

The guideline harvest level was set at 40,000 pounds for the Akutan area (state waters of the Bering Sea south of Cape Sarichef on Unimak Island, and north of Akutan and Akun Islands, and also federal waters of the Western Gulf of Alaska between 164° 44' and 166° West longitude). The GHL was also 40,000 pounds for the Unalaska area (state waters of the Bering Sea north of Unalaska Island and the east end of Umnak Island, and federal waters of the Western Gulf of Alaska between 166° and 168° West longitude). The GHL for the previously described area west of 168° West longitude was 20,000 pounds.

Directed fishing effort for black rockfish in 1998 started July 21 in the Akutan area. Five vessels made 29 deliveries for a total harvest of 38,296 pounds before the Akutan District was closed by EO on August 1. Average exvessel price per pound was \$0.29, which produced a total fishery value of approximately \$11,100.

The nature of the fishery also changed in 1998. The fishery was dominated by short day trips and small loads. The average delivery in 1998 was just over 1,300 pounds, compared to approximately 3,900 pounds for the prior years. In 1998 the average vessel length of participating vessels decreased from 36 feet to 23 feet, and the average trip length was less than one day in 1998 compared to approximately two days in prior years. All fishing effort occurred in the Akutan area.

A total of eight vessels registered for this fishery in 1998, four of which indicated they would operate in the Unalaska area. However, no harvest of black rockfish was reported for this area, and the fishery remained open to the end of the year. This marks the first year in this fishery since 1994 that no commercial effort toward black rockfish in the Unalaska area occurred.

### ***1999 Fishery***

The department reduced the 1999 GHF in both the Akutan and Unalaska areas from 40,000 pounds to 35,000 pounds. The reduction was due to departmental concerns of localized depletion of the black rockfish stocks around Akutan Island and the eastern part of Unalaska Island. Since 1995 approximately 60% of the black rockfish harvested came from two statistical areas, one from just south of Akutan Island and the other from the outer coast of Sedanka Island (Figure 11). This reduction was announced by news release on April 22. Fishers were encouraged at that time to spread their effort from previously fished areas to lessen the impact on those local populations.

Eight vessels registered for the directed fishery in 1999; five vessels made 38 deliveries for a harvest of 20,866 pounds. Four more vessels made four deliveries with 23 pounds of black rockfish as a bycatch to other species. The total harvest for the state-managed fishery in 1999 was 20,889 pounds (Table 2); this included all state waters of the Aleutian Islands and federal waters of the Western Gulf of Alaska between 164° 44' West longitude and 170° West longitude.

Average exvessel price per pound in 1999 was \$0.35 (Table 2). The estimated fishery value was \$7,200. This compares to an average exvessel price of \$0.29 per pound and a fishery value of \$11,100 in the 1998 fishery.

The fishery started in mid June, and all effort ceased by late September (Figure 12). The fishery remained open for the rest of the year. No directed effort occurred during July; the participating vessels fished their halibut quota shares at that time.

Average delivery in the directed fishery was 550 pounds, less than in 1998 when the average was just over 1,300 pounds and significantly under the 3,900 pound average for the years 1996 and 1997. The decrease in average delivery may be due to smaller vessels making shorter trips. In 1999 the average length of participating vessels was 20 feet, a decrease from 23 feet in 1998, and from 36 feet in the 1996 and 1997 fisheries. The average trip length was less than one day in 1999, the same as in 1998 and less than the two day average in prior years. The lower average delivery in 1999 may also be due to localized depletion of the population most heavily fished. Directed harvest occurred in all three districts (Table 3), but primarily occurred in the Akutan

District. Most of the harvest was just south of Akutan Island between Talus Point and Green Bight.

Results from limited Akutan dockside sampling in 1999 show the average and median length of harvested black rockfish to be 45 cm (Table 4 and Figure 13). The average age was 16 years and the median age was 15 years (Table 4 and Figure 14). All sampled rockfish came from the area between Talus Point and Green Bight.

### *Summary*

Total harvest for this fishery since 1995 is approximately 179,400 pounds. The fishery value to date is in excess of \$56,000. In the three years of harvest from the Akutan District, 61% has come from the area just south of Akutan Island. Fisherman were encouraged to direct their efforts to other areas in order to maintain a fishery for this long lived and slow growing, non-migratory rockfish. In 1999, 62% of the harvest came from just south of Akutan Island; to prevent localized depletion the ADF&G is considering a reduction in the GHF for that area or a partial closure of the Akutan District in 2000.

### *Status of Stock*

There has been little stock assessment activity by ADF&G in the Aleutian Islands for black rockfish. The department established a dockside sampling program in 1999. Information obtained through this program will provide the department with basic population data, which will provide the basis for future management decisions.

## **GROUND FISH HARVEST IN STATE WATERS OF THE BERING SEA – ALEUTIAN ISLANDS AREA IN FEDERALLY-MANAGED FISHERIES**

The Alaska Department of Fish and Game (ADF&G) manages the sablefish and black rockfish fisheries in the state waters of the Bering Sea - Aleutian Islands (BSAI) Area (Figure 1); all other groundfish fisheries are managed by the National Marine Fisheries Service (NMFS). Those specific fisheries are for Pacific cod, walleye pollock *Theragra chalcogramma*, Atka mackerel *Pleurogrammus monopterygius*, Pacific ocean perch, red rockfish (shortraker, rougheye, sharpchin and northern rockfish), Greenland turbot, arrowtooth flounder *Atheresthes stomias*, flathead sole *Hippoglossoides elassodon*, yellowfin sole *Pleuronectes asper*, rock sole *P. bilineatus*, an aggregated rockfish species complex, and an aggregated flatfish species complex. These fisheries take place primarily in federal waters of the Exclusive Economic Zone (EEZ), however some of the harvest occurs in waters under the jurisdiction of the State of Alaska. The state waters are from 0 to 3 nautical miles and federal waters are from 3 to 200 nautical miles offshore. The following summary is based on ADF&G fish ticket data.

Harvest of Pacific cod in the state waters of the BSAI Area during 1999 was 18.3 million pounds taken by 162 vessels (Table 5). Most of the harvest came from directed trawl and pot fisheries.

Harvest of Pacific cod was predominately (95%) from the waters south of Cape Sarichef. The harvest has varied widely in recent years (Figure 15); the variation in harvest is not in relation to the total allowable catch (Table 6). The 1999 harvest was above the recent average harvest of 15.1 million pounds, however the overall number of vessels has decreased and the number of deliveries has decreased considerably since 1995.

Walleye pollock harvest in the state waters of the BSAI Area in 1999 was 1.8 million pounds by 26 vessels. Ninety-four percent of that harvest was from the waters north of 54° 36' North latitude, the latitude of Cape Sarichef on Unimak Island. Walleye pollock harvest was primarily as bycatch in other trawl fisheries, with only two vessels landing 100,000 pounds or greater during the year. The harvest of walleye pollock from 1995 to 1998 was predominantly (89%) from the waters surrounding the Aleutian Islands. The overall decrease in harvest since 1995 may be attributed to the decline in total allowable catch (TAC). The low harvest in 1999 is mainly due to the closure of the Aleutian Islands west of 170° West longitude to walleye pollock harvest (Figure 16). The number of vessels and deliveries has also decreased.

Atka mackerel harvest in state waters around the Aleutian Islands in 1999 was 495,117 pounds, significantly exceeding the harvest in recent years (Figure 17). The harvest of Atka mackerel from state waters of Alaska is not directly related to the available TAC. Two trawl vessels took 95% of the total harvest in the directed fishery; the rest was taken as bycatch in other trawl, pot and longline fisheries. The 1999 catch reverses a recent trend of declining state-waters harvest.

No harvest of Atka mackerel occurred in waters north of the latitude of Cape Sarichef.

There are 34 species of rockfish in Alaskan waters, of which 13 occur in the Bering Sea – Aleutian Islands Area. For management purposes these species are put into five groups. Pacific ocean perch is one group. In the Aleutian Islands, shortraker and rougheye rockfish are considered as a group, while sharpchin and northern rockfish form another group. In the Bering Sea shortraker, rougheye, sharpchin and northern rockfish are combined to form the “other red rockfish” group. All remaining rockfish species comprise the “other rockfish” group.

Harvest of Pacific ocean perch during 1999 occurred entirely in the waters surrounding the Aleutian Islands. Thirteen vessels harvested a total of 44,276 pounds from state waters. Effort and harvest in state waters varies yearly (Figure 18), and does not vary in relation to the TAC. All harvest was as bycatch in other fisheries, and trawl vessels accounted for all but 1,100 pounds of the total harvest.

Nine vessels fished for shortraker and rougheye rockfish in state waters during 1999 and harvested 13,551 pounds. This reverses a recent trend in declining state waters harvest (Figure 19). All harvest was bycatch in other fisheries; 91% was by longline vessels. Sharpchin and northern rockfish harvest in 1999 totaled 23,128 pounds, an amount greater than the previous four-year average harvest but less than one-half the highest harvest in 1996. Fourteen vessels fishing state waters in 1999 was the most in recent years. Participation and harvest varies widely between years (Figure 20). All harvest in 1999 occurred as bycatch in other fisheries, with 98% of the harvest from trawl fisheries. The amount of these four species harvested in state waters is not directly related to the available TAC. No harvest of other red rockfish occurred in state waters of the Bering Sea, despite available TAC, in the years 1995 through 1999.



Harvest of fish in the other rockfish group has generally increased over the last five years as the number of vessels remained relative constant and the number of deliveries has varied widely (Figure 21). The available TAC has remained relatively constant during those years. Forty-three vessels harvested 125,663 pounds from the waters around the Aleutian Islands in 1999. All harvest was bycatch in other fisheries, most was taken by trawl vessels (71%) and longline vessels (28%). Harvest included the following species of rockfish: dusky, harlequin *S. variegatus*, and redbanded *S. babcocki*. In previous years darkblotched rockfish *S. crameri* was also harvested. Thornyhead rockfish *Sebastolobus* were the most abundant rockfish harvested from 1995 through 1999. The ADF&G fish ticket database also contains records of harvest for yelloweye *Sebastes ruberrimus*, yellowmouth *S. reedi*, greenstripe *S. elongatus*, rosethorn *S. helvomaculatus* and tiger *S. nigrocinctus* rockfish although their distribution in the BSAI Area is questionable.

There are 30 species of flatfish in Alaskan waters, 26 of which occur in the BSAI Area. For management purposes these species are split into five fisheries. There are fisheries for Greenland turbot, yellowfin sole, rock sole, and flathead sole. All remaining flatfish species are harvested in a fishery for the species complex called other flatfish.

The 1999 harvest of Greenland turbot from the BSAI Area was entirely from the waters surrounding the Aleutian Islands. Twenty vessels harvested 129,937 pounds (Table 7); 86% of the harvest was by longline vessels, 9% by trawl vessels and 5% by vessels using pot gear. The overall effort and harvest was the lowest of the five-year interval from 1995 to 1999 (Figure 22). The yearly harvest is not directly related to the available TAC. While virtually all of the harvest occurred during the open directed fishing season, most fishing effort was in conjunction with the Pacific halibut and sablefish fisheries.

Harvest of arrowtooth flounder in 1999 was significantly greater than the recent average harvest and the number of vessels and deliveries was less than their recent levels (Figure 23). Twenty-two vessels harvested 673,331 pounds; over 99% was from Aleutian Islands waters. Harvest of arrowtooth flounder in state waters has generally varied in relation to the available TAC, however the reason for the substantial increase observed in 1999 is not known. Trawl vessels took 99% of the harvest, while vessels using longline and pot gear split the remainder. All harvest was as bycatch in other fisheries.

Rock sole harvest was mainly (72%) from the waters of the Aleutian Islands. The total harvest was 211,701 pounds and was taken by 21 vessels. Harvest levels have fluctuated widely and the 1999 harvest was the most in recent years (Figure 24). Harvest in state waters, except for 1997, has varied in relation to the available TAC. The number of deliveries and vessels varied by year in synchrony with the harvest except for 1999; the reason(s) for the deviation from the pattern in 1999 is not known. Over 99% of the harvest was by trawl vessels, and 28% of the harvest was during the open fishery period.

State-water harvest of yellowfin sole in 1999 was 56,686 pounds. This harvest was taken by 10 vessels. Virtually all harvest was by trawl gear, and was as bycatch in other fisheries. State waters harvest varies widely between years (Figure 25); 98% of the harvest was from waters surrounding the Aleutian Islands in 1999, while 91% came from waters north of the latitude of Cape Sarichef in 1998. Harvest of yellowfin sole in state waters has no direct relation to the available TAC.

Flathead sole state waters harvest in 1999 was 78,986 pounds by 14 vessels. Seventy percent of the harvest came from the waters north of Cape Sarichef. All flathead sole harvested in state waters was as bycatch. Number of vessels and deliveries, and the harvest varies by year (Figure 26), and is not directly related to the available TAC. The harvest has averaged approximately 60,000 pounds during the last four years.

Harvest of fish in the other flatfish group has increased greatly over that of 1995, and since 1996 has averaged 45,800 pounds per year. The harvest has, in general, not varied in relation to the available TAC. The number of participating vessels and the number of deliveries have varied according to the harvest (Figure 27). In 1999 the 16 vessels harvested 46,667 pounds primarily from the waters around the Aleutian Islands. In 1999 all harvest was as bycatch, and all was taken by trawl vessels. Harvest included the following species of flatfish: Dover sole *Microstomus pacificus*, rex sole *Errex zachirus*, starry flounder *Platichthys stellatus*, and Alaska plaice *Pleuronectes quadrituberculatus*. In previous years butter sole *P. isolepsis* and English sole *P. vetulus* were also harvested.

Harvest of fish from the state waters of Alaska, during federally managed fisheries, from 1995 through 1999 has averaged approximately 43.9 million pounds per year and totaled more than 218.9 million pounds. Total walleye pollock harvest for that period was 134.9 million pounds, Pacific cod harvest was 78.8 million pounds, and the harvest of Atka mackerel and all rockfish species totaled approximately 900,000 pounds each. Greenland turbot harvest during the five-year period was 1.4 million pounds, while harvest of arrowtooth flounder was almost 800,000 pounds and rock sole was just over 600,000 pounds. The remaining flatfish species harvest totaled less than 600,000 pounds. The harvest of walleye pollock and rock sole from state waters varies according to the available TAC. Other groundfish harvest in state waters is generally independent of the TAC, and is probably due more to species distribution, prey distribution, weather, and other environmental factors.

Table 1. Aleutian Islands sablefish fishery harvest statistics and economic performance, 1995 - 1999.

| Year | Guideline<br>Harvest Level <sup>a</sup> | Number of |            | Harvest <sup>a</sup> | Exvessel<br>Value <sup>b</sup> | Fishery<br>Value |
|------|---|-----------|------------|----------------------|--------------------------------|------------------|
|      |   | Vessels   | Deliveries |                      |                                |                  |
| 1995 | 400,000                                 | 37        | 61         | 272,320              | \$2.96                         | \$500,000        |
| 1996 | 280,000                                 | 35        | 67         | 401,328              | \$2.54                         | \$642,000        |
| 1997 | 270,000                                 | 39        | 75         | 317,408              | \$3.55                         | \$710,000        |
| 1998 | 270,000                                 | 38        | 101        | 254,348              | \$2.18                         | \$350,000        |
| 1999 | 250,000                                 | 23        | 37         | 279,649              | \$2.69                         | \$474,000        |

<sup>a</sup>In round pounds.

<sup>b</sup>Per pound dressed weight.

Table 2. Aleutian Islands rockfish fishery harvest statistics and economic performance, 1994 – 1999.

| Year              | Guideline<br>Harvest Level <sup>a</sup> | Number of             |            | Harvest <sup>a</sup> | Exvessel<br>Value <sup>b</sup> | Fishery<br>Value |
|-------------------|---|-----------------------|------------|----------------------|--------------------------------|------------------|
|                   |   | Vessels               | Deliveries |                      |                                |                  |
| 1994 <sup>c</sup> | 100,000                                 | NO COMMERCIAL HARVEST |            |                      |                                |                  |
| 1995 <sup>c</sup> | 100,000                                 | CONFIDENTIAL          |            |                      |                                |                  |
| 1996 <sup>c</sup> | 100,000                                 | 6                     | 13         | 17,203               | \$0.18                         | \$ 3,100         |
| 1997 <sup>c</sup> | 100,000                                 | 3                     | 18         | 102,746              | \$0.34                         | \$35,000         |
| 1998 <sup>d</sup> | 100,000                                 | 5                     | 29         | 38,296               | \$0.29                         | \$11,100         |
| 1999 <sup>d</sup> | 90,000                                  | 9                     | 41         | 20,889               | \$0.35                         | \$7,200          |

<sup>a</sup>In round pounds.

<sup>b</sup>Per pound round weight.

<sup>c</sup>Black and dusky rockfish.

<sup>d</sup>Black rockfish only.

Table 3. Aleutian Islands rockfish fishery harvest by area, 1994 – 1998.

| Year | Akutan/Akun      |              | Unalaska/Sedanka/Unalga |              | West of 168° W. long. |              |
|------|------------------|--------------|-------------------------|--------------|-----------------------|--------------|
|      | GHL <sup>a</sup> | Harvest      | GHL                     | Harvest      | GHL                   | Harvest      |
| 1994 | 50,000           | 0            | 50,000                  | 0            | NA                    |              |
| 1995 | 50,000           | 0            | 50,000                  | Confidential | NA                    |              |
| 1996 | 50,000           | 0            | 50,000                  | 17,203       | NA                    |              |
| 1997 | 50,000           | Confidential | 50,000                  | Confidential | NA                    |              |
| 1998 | 40,000           | 38,296       | 40,000                  | 0            | 20,000                | 0            |
| 1999 | 35,000           | 13,465       | 35,000                  | Confidential | 20,000                | Confidential |

<sup>a</sup>Guideline harvest level in round pounds.

Table 4. Black rockfish age (from otoliths) and length data obtained from fish harvested along the outer coast of Sedanka Island in 1997 and from just south of Akutan Island in 1999.

| Year | Sample Size | Age <sup>a</sup> |          | Length <sup>b</sup> |          |
|------|-------------|------------------|----------|---------------------|----------|
|      |             | Average          | Range    | Average             | Range    |
| 1997 | 9           | 17.1             | 11 to 32 | 43.9                | 35 to 49 |
| 1999 | 92          | 15.9             | 8 to 30  | 45.3                | 37 to 51 |

<sup>a</sup>In years.

<sup>b</sup>In centimeters.

Table 5. Harvest, number of vessels and deliveries from state waters of Alaska in the federally managed Pacific cod, walleye pollock, Atka mackerel, Pacific ocean perch, shortraker/rougheye rockfish, sharpchin/northern rockfish ,and other rockfish fisheries in the Bering Sea - Aleutian Islands Area from 1995 through 1999.

| Year |            | Pacific<br>Cod | Walleye<br>Pollock | Atka<br>Mackerel | Pacific<br>Ocean<br>Perch | Shortraker<br>Rougheye<br>Rockfish | Sharpchin<br>Northern<br>Rockfish | Other<br>Rockfish |
|------|------------|----------------|--------------------|------------------|---------------------------|------------------------------------|-----------------------------------|-------------------|
| 1995 | Harvest    | 21,704,155     | 49,419,540         | 275,780          | 48,055                    | 17,505                             | 2,221                             | 33,776            |
|      | Vessels    | 192            | 55                 | 43               | 23                        | 24                                 | 7                                 | 44                |
|      | Deliveries | 1,110          | 162                | 101              | 37                        | 27                                 | 8                                 | 100               |
| 1996 | Harvest    | 19,613,804     | 31,373,235         | 103,032          | 105,399                   | 11,672                             | 57,779                            | 82,484            |
|      | Vessels    | 189            | 66                 | 13               | 30                        | 26                                 | 10                                | 45                |
|      | Deliveries | 1,030          | 160                | 21               | 42                        | 34                                 | 12                                | 78                |
| 1997 | Harvest    | 7,023,993      | 32,396,860         | 18,536           | 24,153                    | 9,159                              | 467                               | 128,076           |
|      | Vessels    | 153            | 57                 | 13               | 26                        | 26                                 | 3                                 | 40                |
|      | Deliveries | 534            | 95                 | 19               | 36                        | 31                                 | 3                                 | 87                |
| 1998 | Harvest    | 12,206,865     | 19,939,077         | 12,336           | 98,954                    | 4,470                              | 11,095                            | 75,095            |
|      | Vessels    | 134            | 58                 | 11               | 25                        | 4                                  | 6                                 | 46                |
|      | Deliveries | 447            | 105                | 16               | 40                        | 9                                  | 8                                 | 138               |
| 1999 | Harvest    | 18,281,773     | 1,758,098          | 495,117          | 44,276                    | 13,551                             | 23,128                            | 125,663           |
|      | Vessels    | 162            | 26                 | 16               | 13                        | 9                                  | 14                                | 43                |
|      | Deliveries | 576            | 44                 | 20               | 20                        | 12                                 | 18                                | 86                |

Table 6. Total allowable catch (TAC) for the federally managed fisheries in the Bering Sea – Aleutian Islands Area in millions of pounds from 1995 through 1999.

| Fishery                      | Year    |         |         |         |         |
|------------------------------|---------|---------|---------|---------|---------|
|                              | 1995    | 1996    | 1997    | 1998    | 1999    |
| Pacific Cod                  | 551.2   | 595.2   | 595.2   | 463.0   | 390.2   |
| Walleye Pollock              | 2,882.8 | 2,704.2 | 2,555.2 | 2,501.8 | 2,193.6 |
| Atka Mackerel                | 176.4   | 234.0   | 147.0   | 141.8   | 146.4   |
| Pacific Ocean Perch          | 27.2    | 30.6    | 34.4    | 29.8    | 32.8    |
| Shortraker/Rougheye Rockfish | 2.4     | 2.5     | 2.1     | 2.1     | 2.1     |
| Sharpchin/Northern Rockfish  | 11.3    | 11.5    | 9.6     | 9.3     | 9.3     |
| Other Red Rockfish           | 2.8     | 2.8     | 2.3     | 0.6     | 0.6     |
| Other Rockfish               | 2.3     | 2.9     | 2.4     | 2.3     | 2.3     |
| Greenland Turbot             | 15.4    | 15.4    | 19.8    | 33.1    | 19.8    |
| Arrowtooth Flounder          | 22.5    | 19.8    | 45.8    | 35.3    | 296.2   |
| Rock Sole                    | 132.3   | 154.3   | 214.3   | 220.5   | 264.6   |
| Yellowfin Sole               | 418.9   | 440.9   | 507.1   | 485.0   | 458.5   |
| Flathead Sole                | 66.1    | 66.1    | 95.9    | 220.5   | 170.4   |
| Other Flatfish               | 43.1    | 77.2    | 111.9   | 197.2   | 339.5   |



Table 7. Harvest, number of vessels and deliveries from state waters of Alaska in the federally managed Greenland turbot, arrowtooth flounder, rock sole, yellowfin sole, flathead sole, and other flatfish fisheries in the Bering Sea - Aleutian Islands Area from 1995 through 1999.

| Year         | Greenland<br>Turbot | Arrowtooth<br>Flounder | Rock<br>Sole | Yellowfin<br>Sole | Flathead<br>Sole | Other<br>Flatfish |
|--------------|---------------------|------------------------|--------------|-------------------|------------------|-------------------|
| 1995 Harvest | 307,033             | 20,822                 | 52,811       | 3,074             | 2,151            | 1,243             |
| Vessels      | 37                  | 32                     | 14           | 8                 | 12               | 12                |
| Deliveries   | 63                  | 61                     | 26           | 16                | 19               | 20                |
| 1996 Harvest | 395,735             | 37,724                 | 126,012      | 88,015            | 73,943           | 40,339            |
| Vessels      | 57                  | 36                     | 27           | 17                | 26               | 29                |
| Deliveries   | 86                  | 49                     | 42           | 25                | 39               | 40                |
| 1997 Harvest | 183,937             | 35,179                 | 85,065       | 229               | 43,645           | 35,547            |
| Vessels      | 45                  | 29                     | 18           | 9                 | 21               | 26                |
| Deliveries   | 77                  | 42                     | 29           | 11                | 36               | 40                |
| 1998 Harvest | 376,015             | 31,787                 | 147,564      | 10,302            | 43,296           | 60,768            |
| Vessels      | 28                  | 22                     | 28           | 13                | 22               | 35                |
| Deliveries   | 85                  | 35                     | 51           | 17                | 41               | 56                |
| 1999 Harvest | 129,937             | 673,331                | 211,701      | 56,686            | 78,986           | 46,667            |
| Vessels      | 20                  | 22                     | 21           | 10                | 14               | 16                |
| Deliveries   | 35                  | 37                     | 43           | 13                | 29               | 20                |

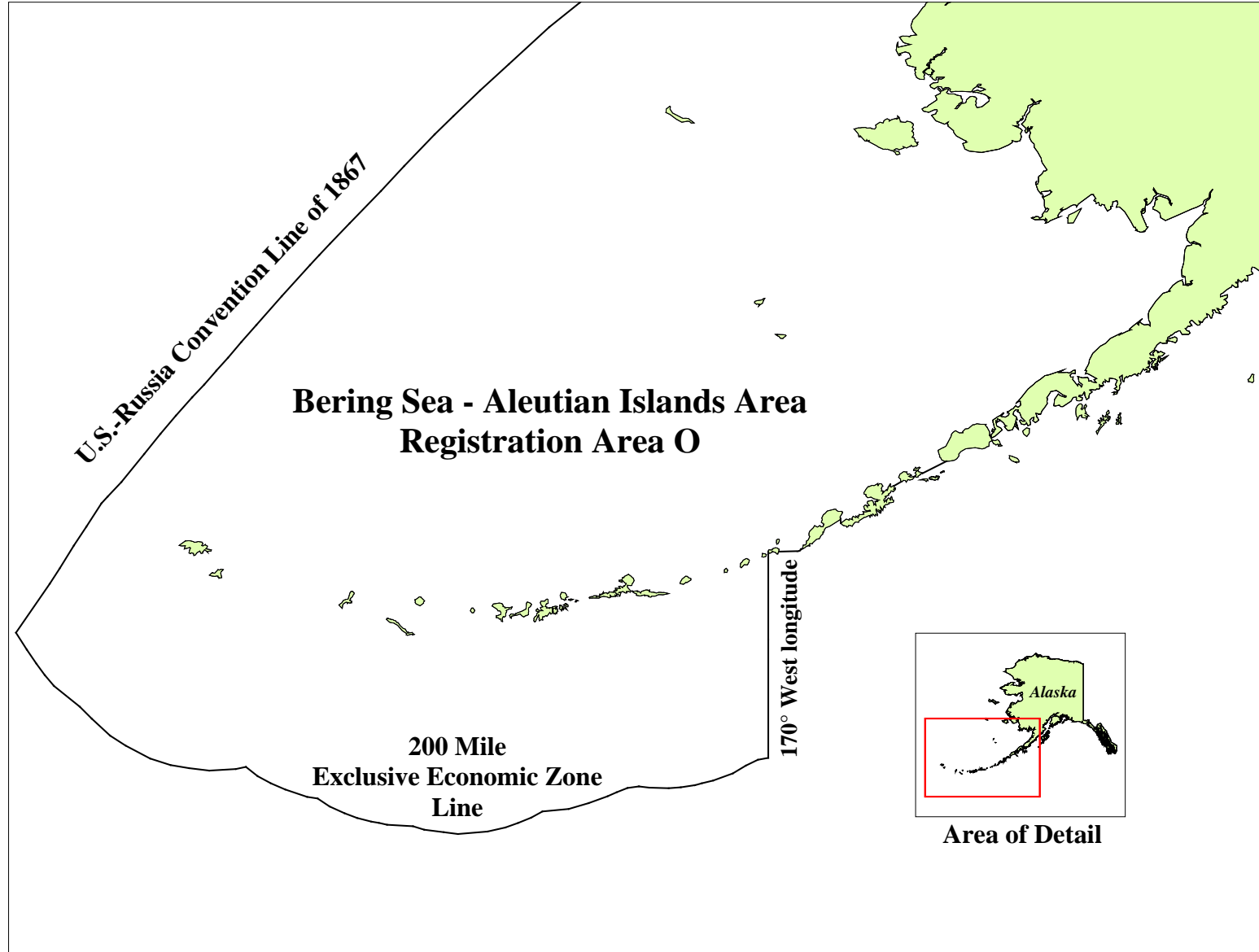


Figure 1. Map of the Bering Sea – Aleutian Islands Area for groundfish management.

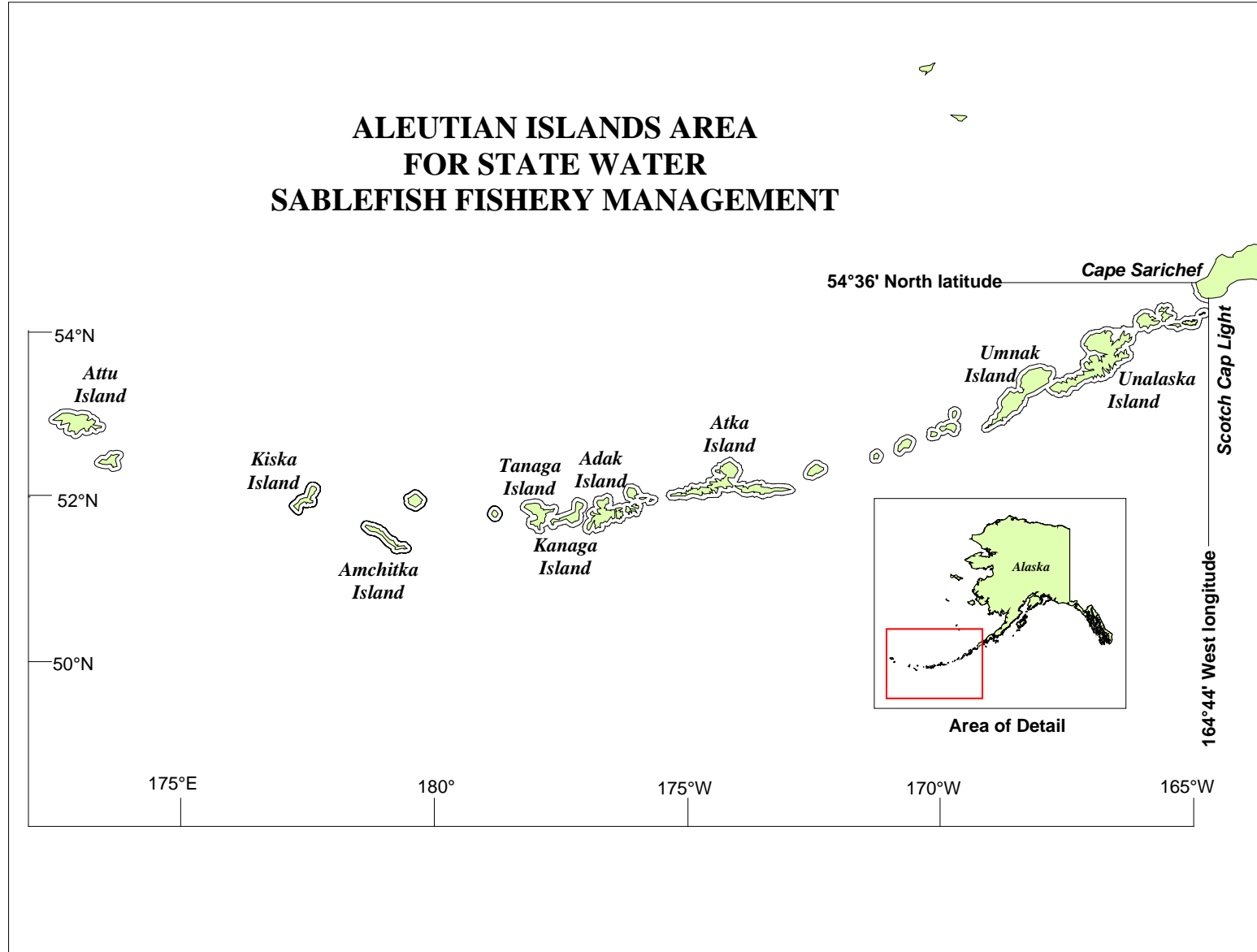


Figure 2. Map of the Aleutian Islands Area for state-waters sablefish fishery management.

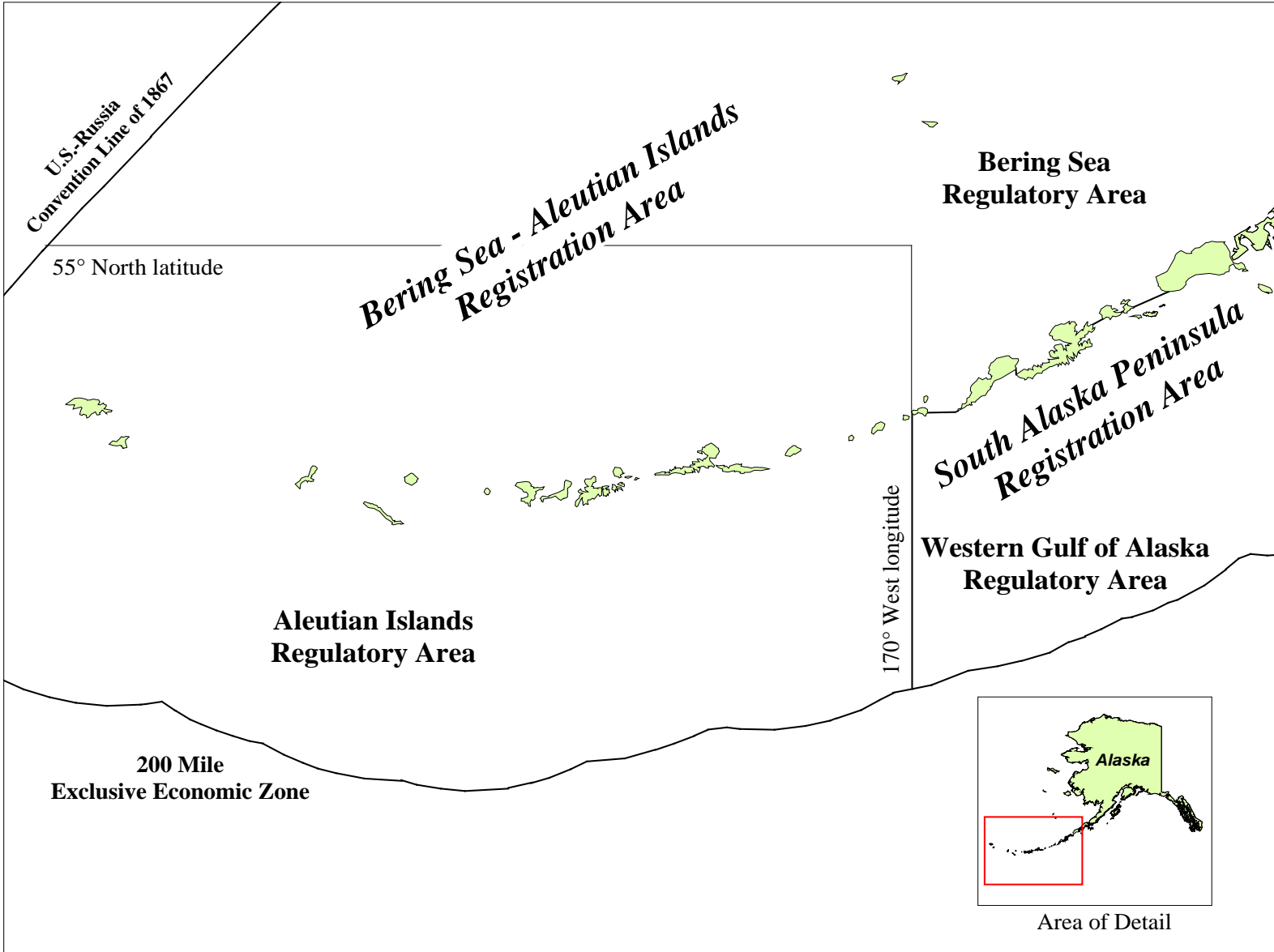


Figure 3. Map of the state registration areas and federal regulatory areas in southwestern Alaska.

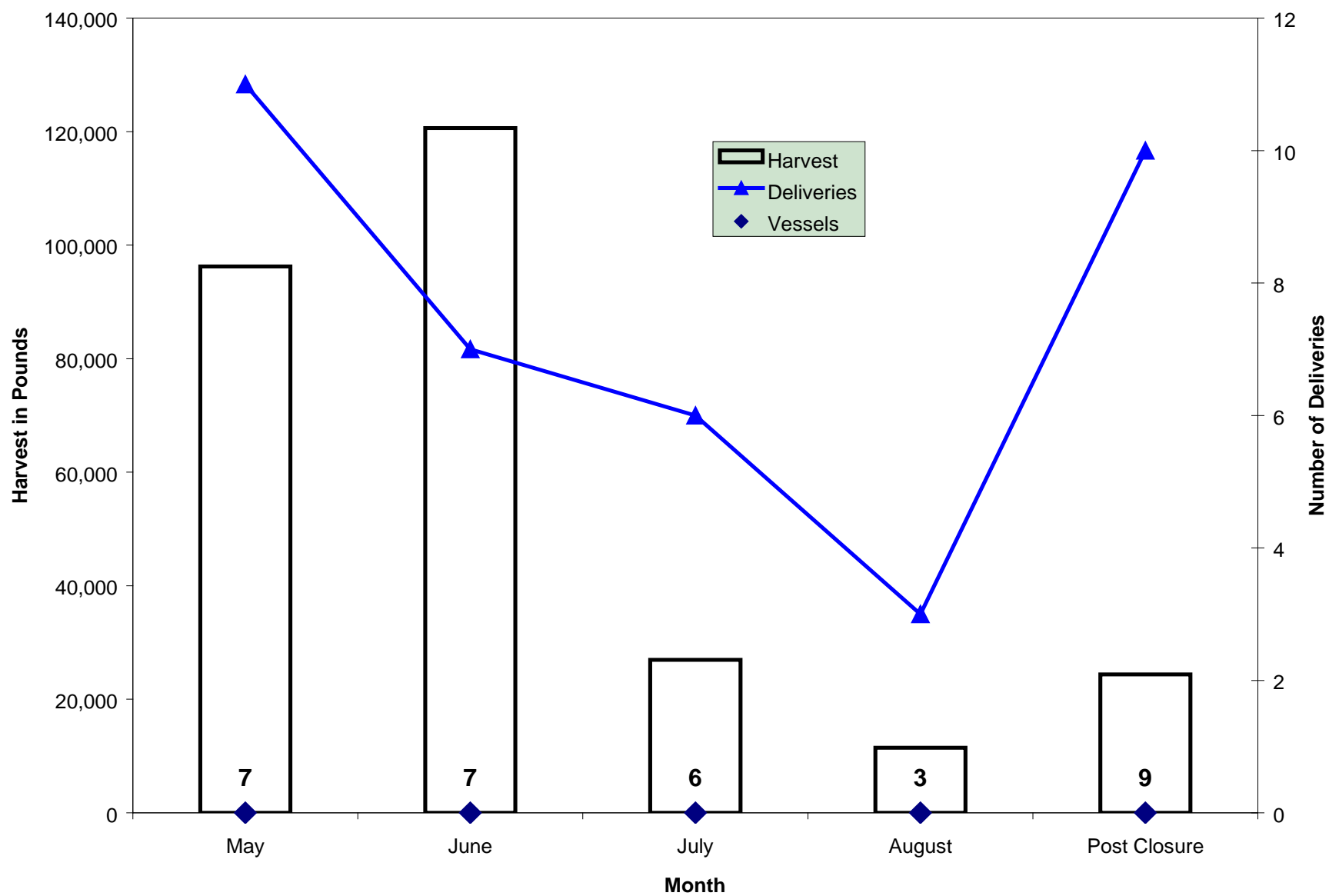


Figure 4. Harvest, number of vessels and landings, by month, observed during the 1999 Aleutian Islands sablefish fishery.

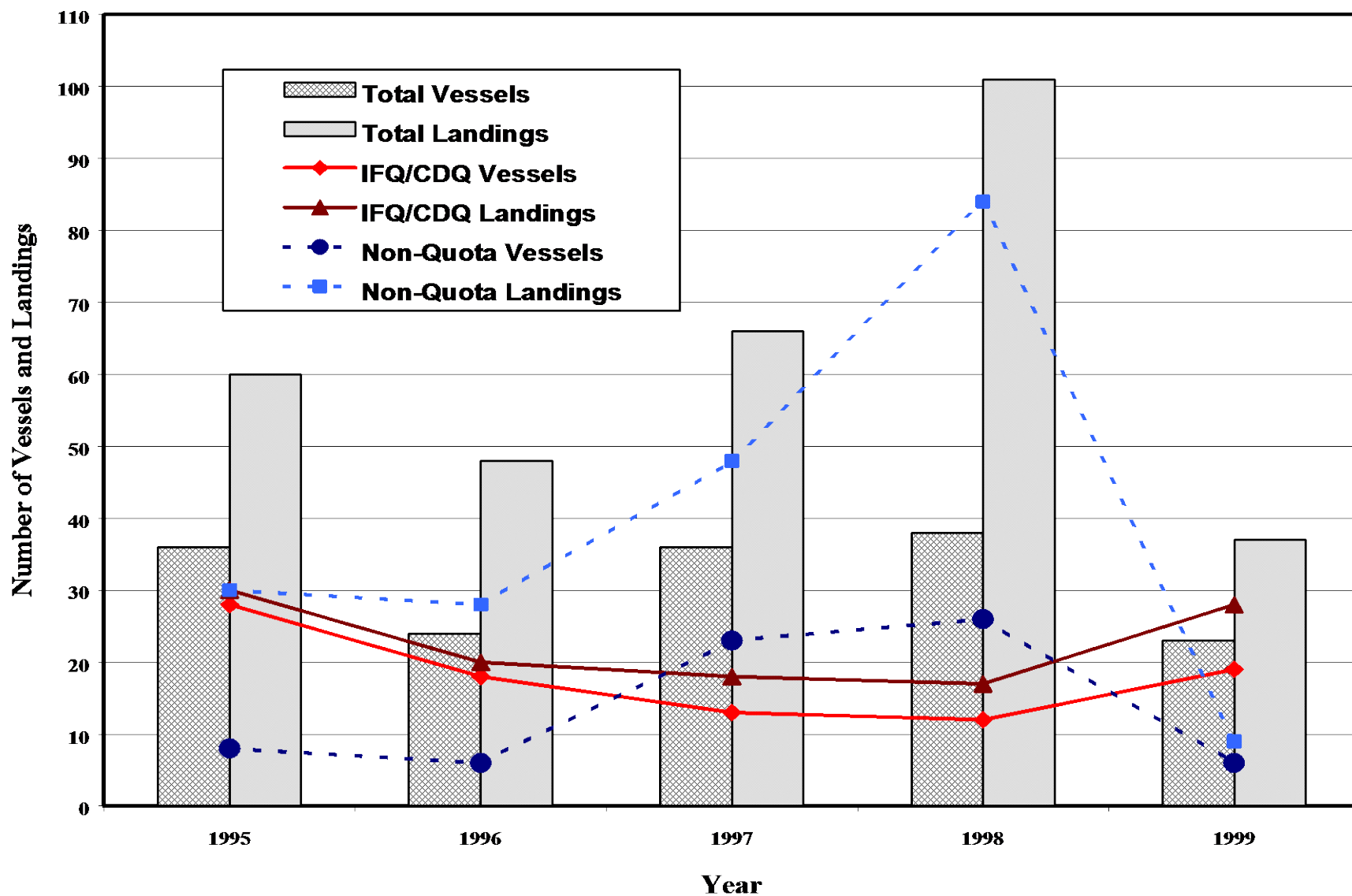


Figure 5. Number of vessels and landings from 1995 through 1999 showing the decrease in non-quota participants and the increase in IFQ participants in the Aleutian Islands sablefish fishery in 1999.

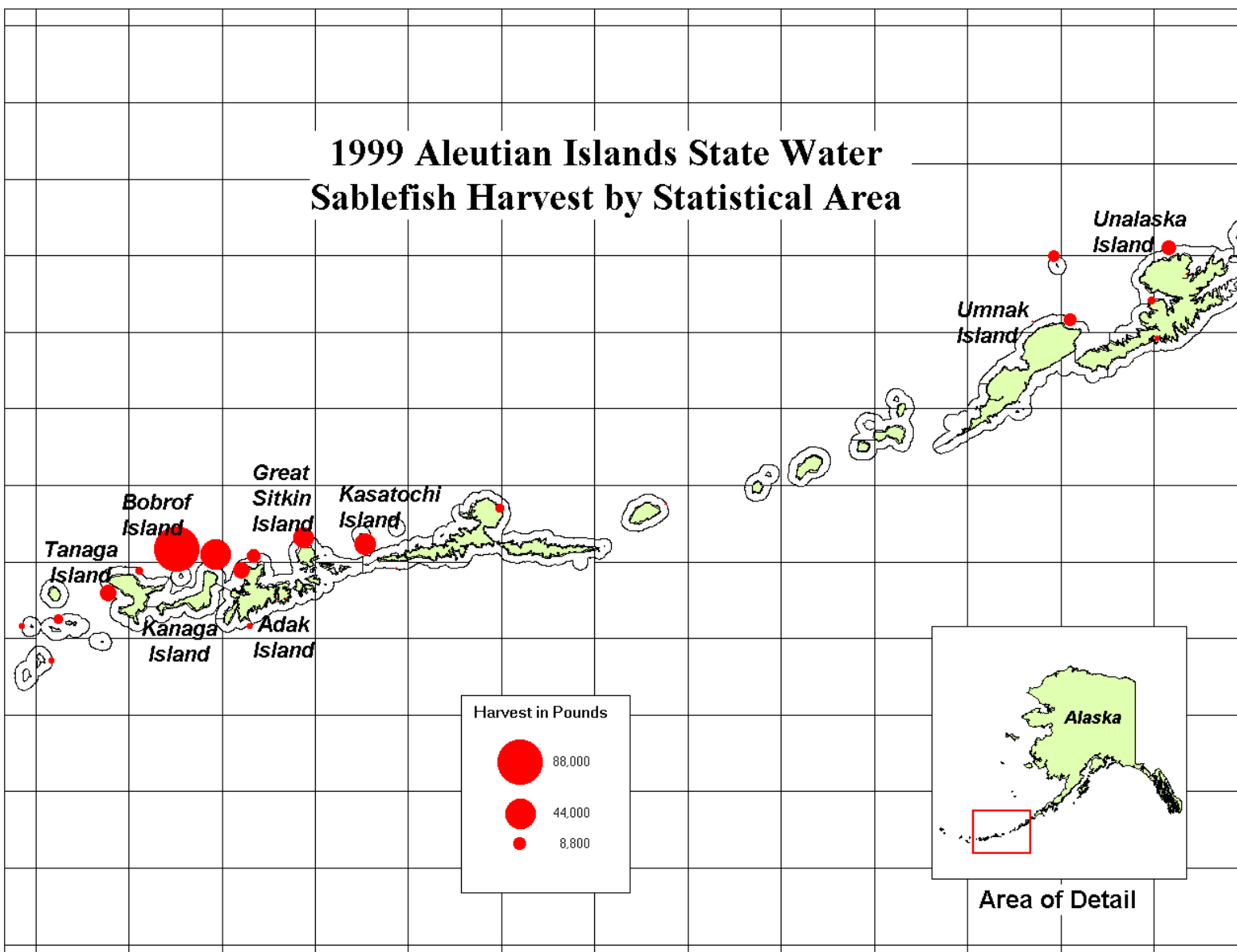


Figure 6. The area of harvest observed in the 1999 state-waters sablefish fishery based on fish ticket data.

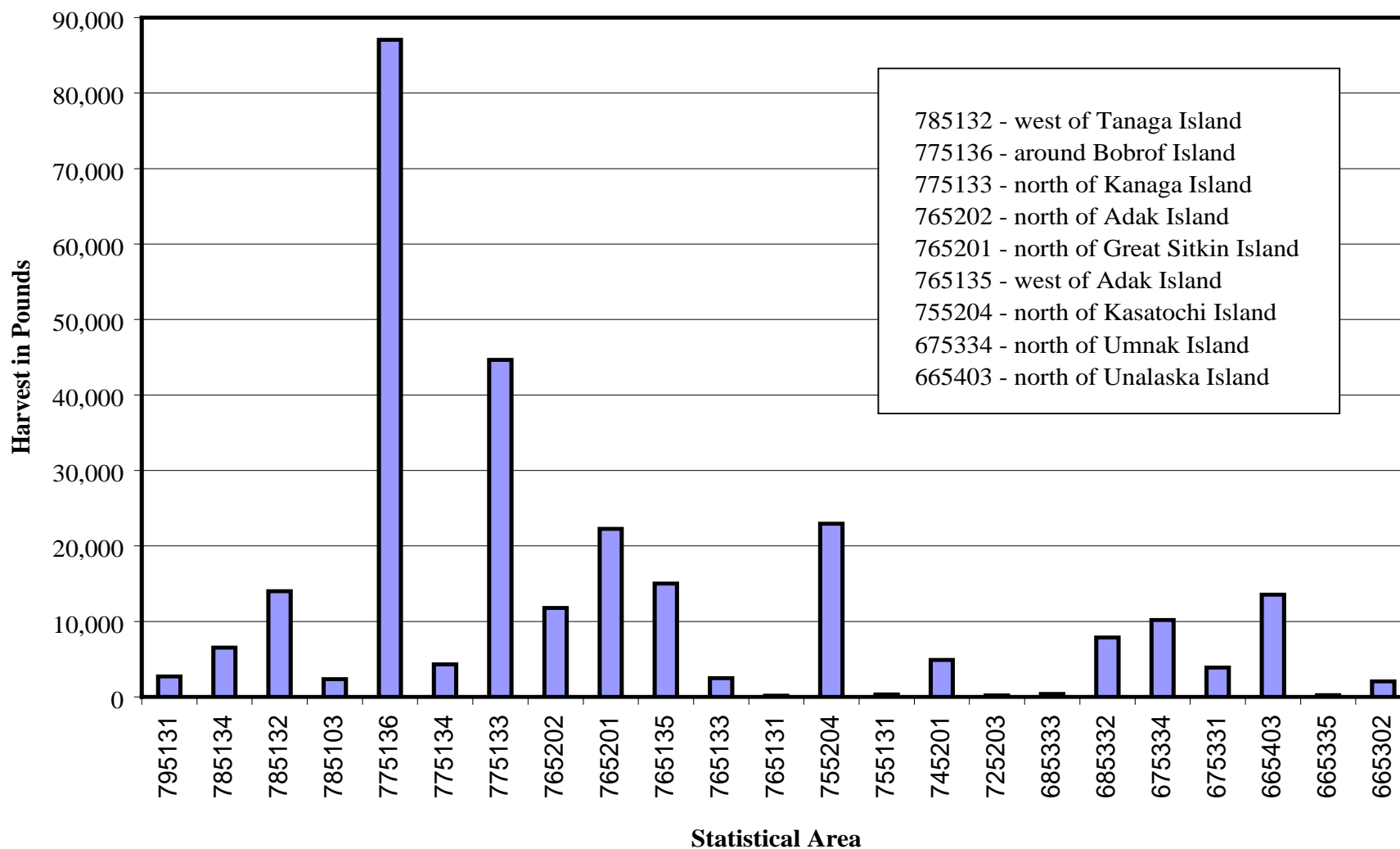


Figure 7. The 1999 harvest of Aleutian Islands sablefish, by statistical area, listing the islands adjacent to the waters with a harvest of 10,000 pounds or more.



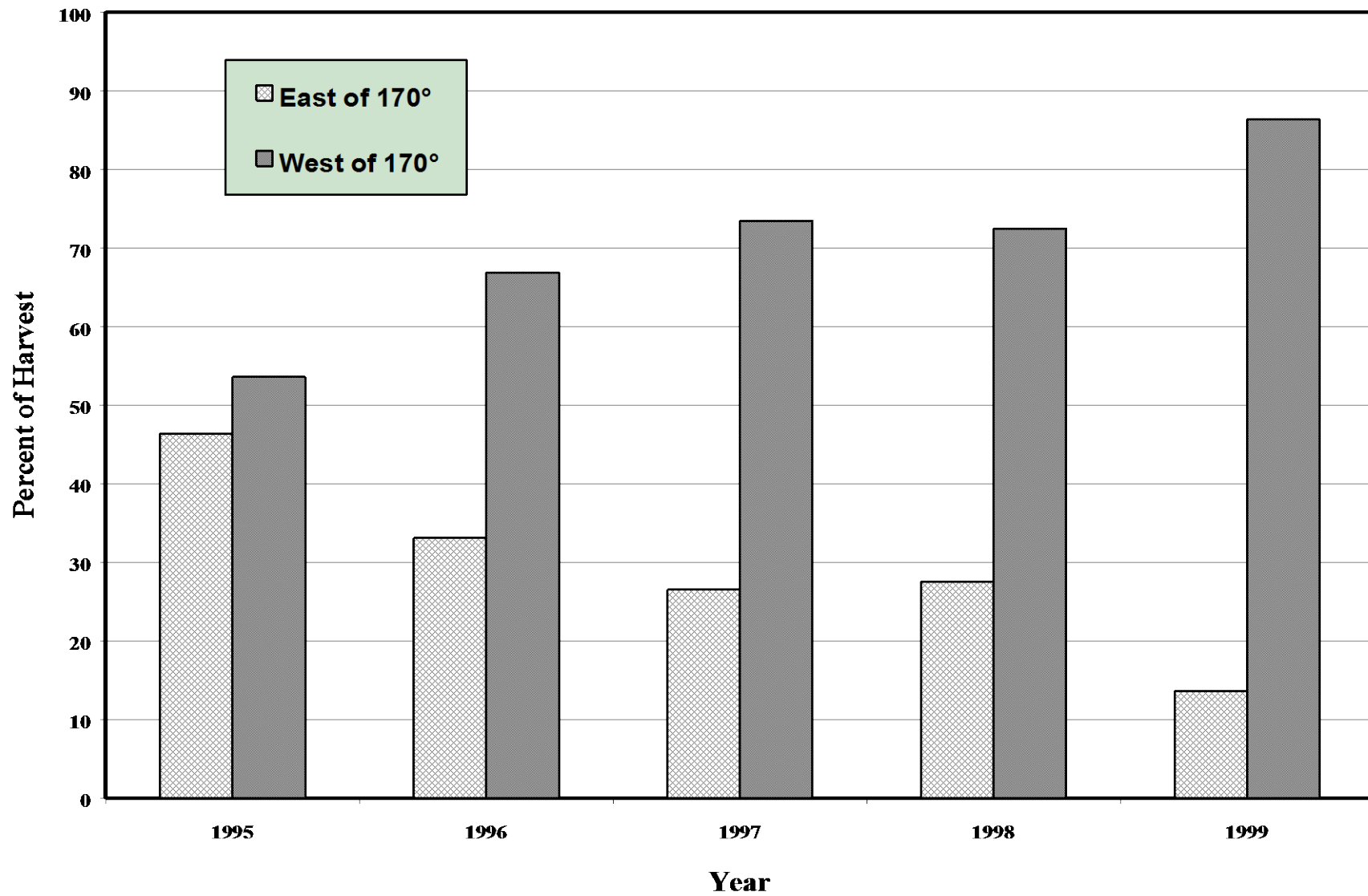


Figure 8. Percentage of harvest east and west of 170° West longitude in the Aleutian Islands sablefish fishery, 1995 to 1999.

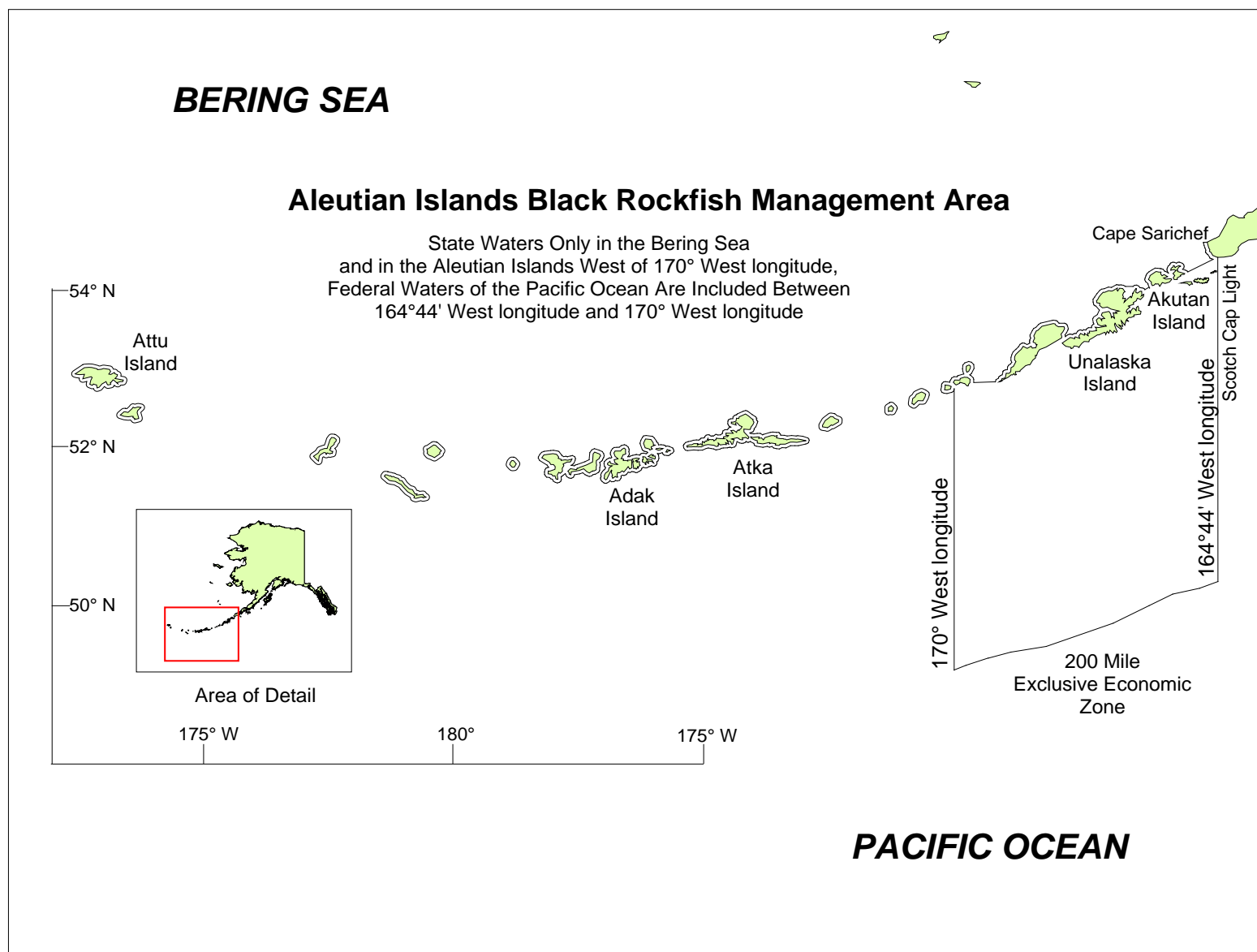


Figure 9. Map of the Aleutian Islands black rockfish registration area.

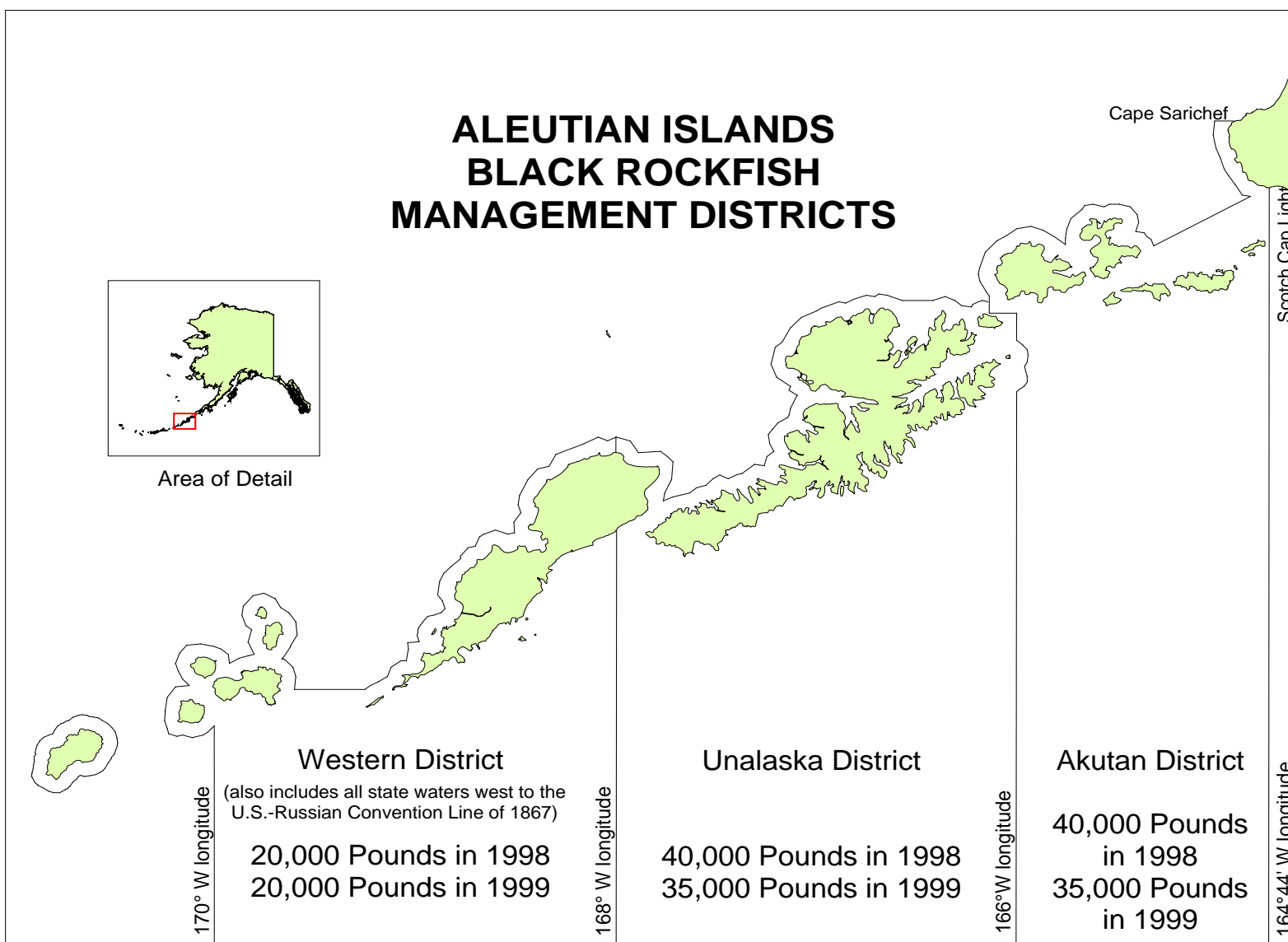


Figure 10. Map of the Aleutian Islands black rockfish management areas showing the guideline harvest levels established for the 1998 and 1999 fisheries.

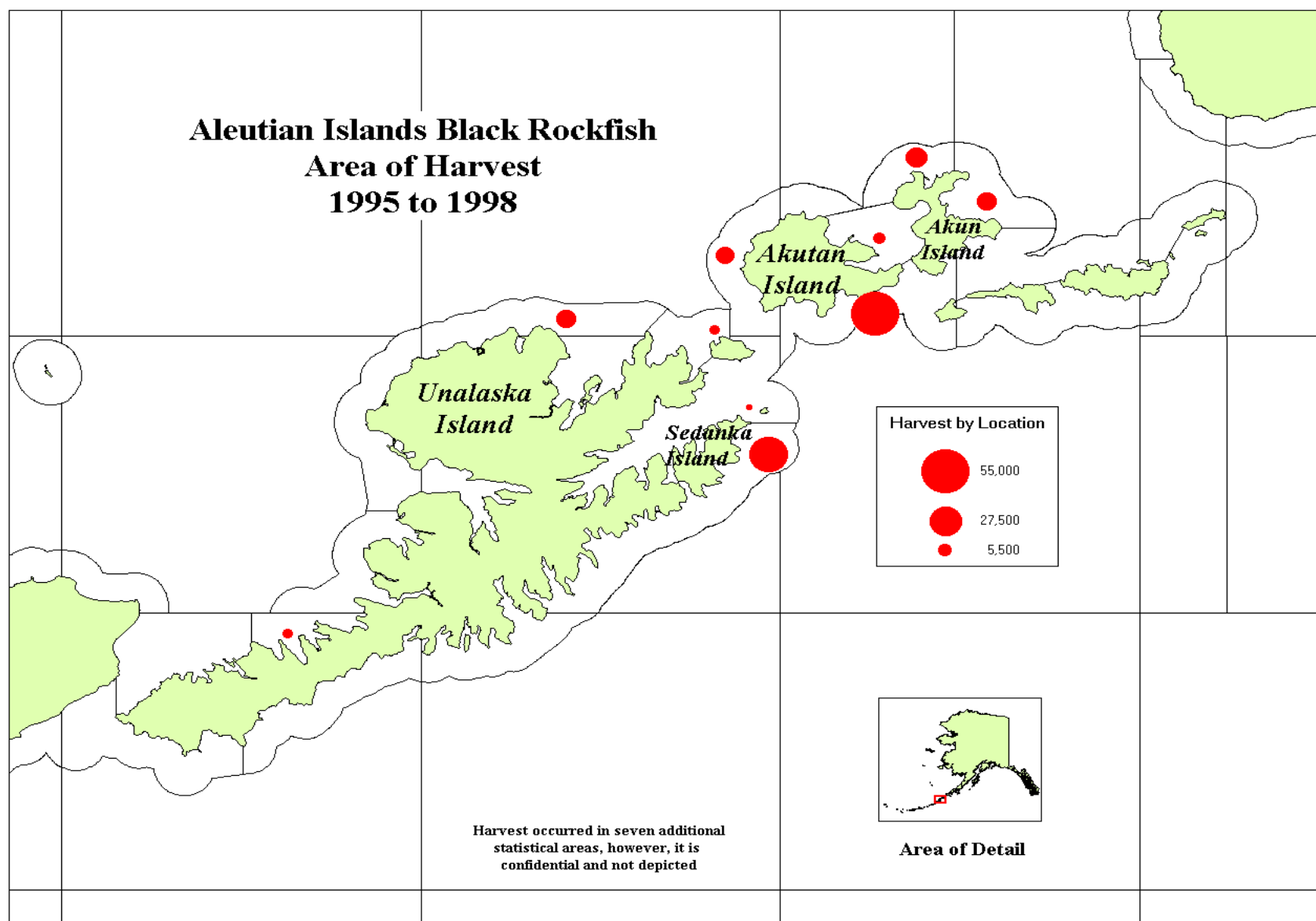


Figure 11. The area of harvest observed in the black rockfish fishery from 1995 through 1998.

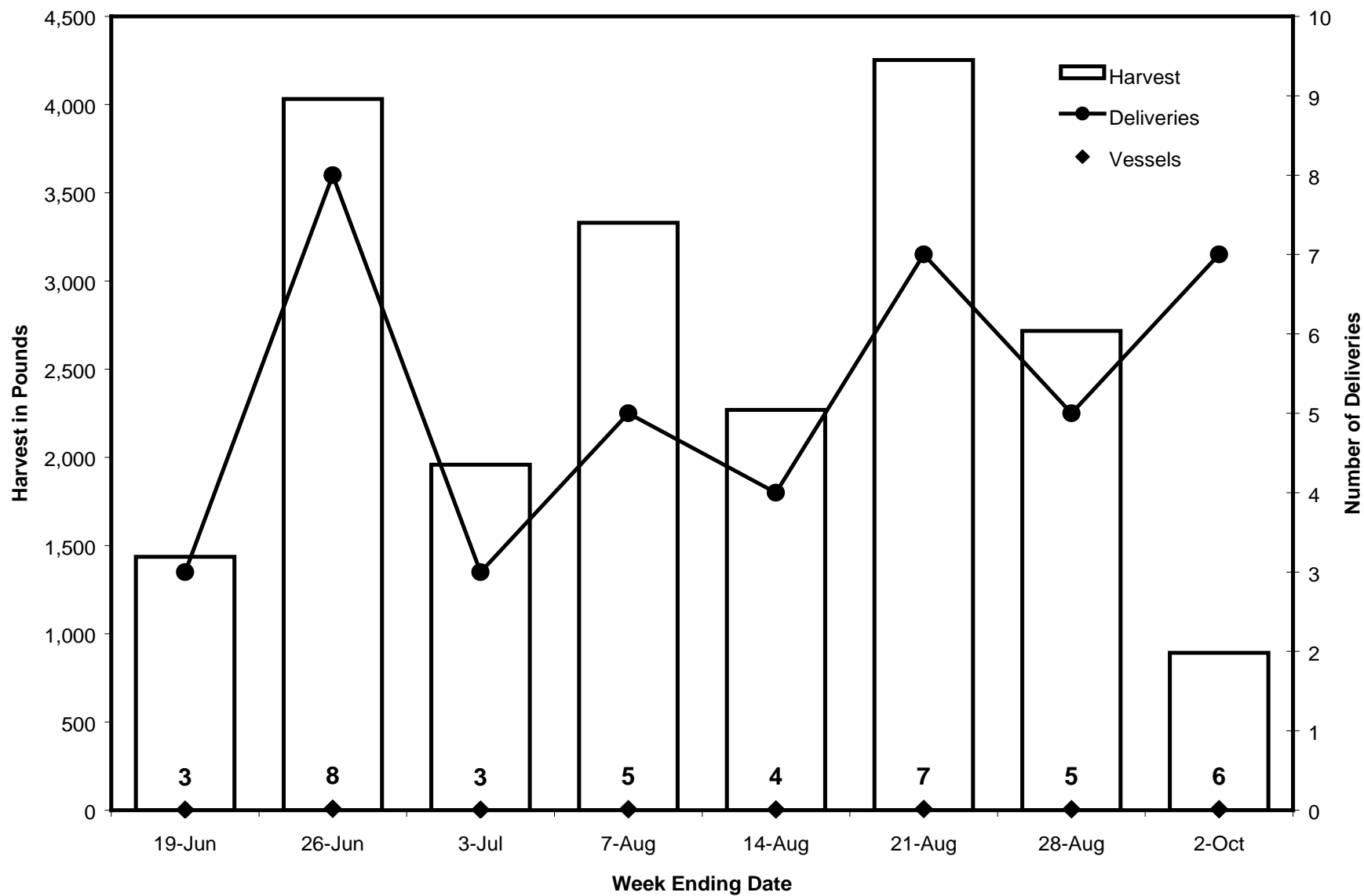


Figure 12. Harvest, number of deliveries and participating vessels by week in the 1999 black rockfish fishery.

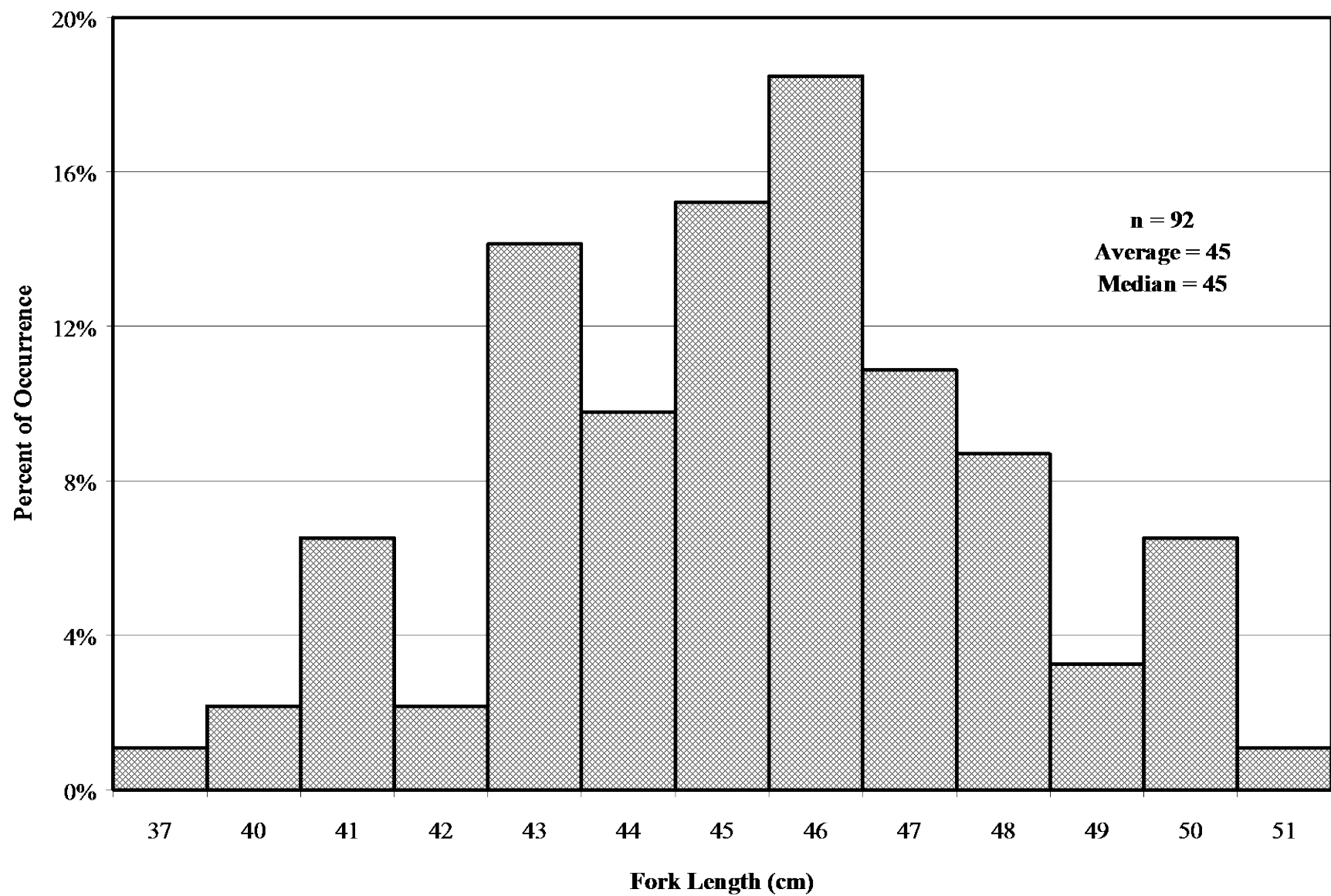


Figure 13. Histogram of the fork length of black rockfish sampled at Akutan in 1999 showing the average and median length.

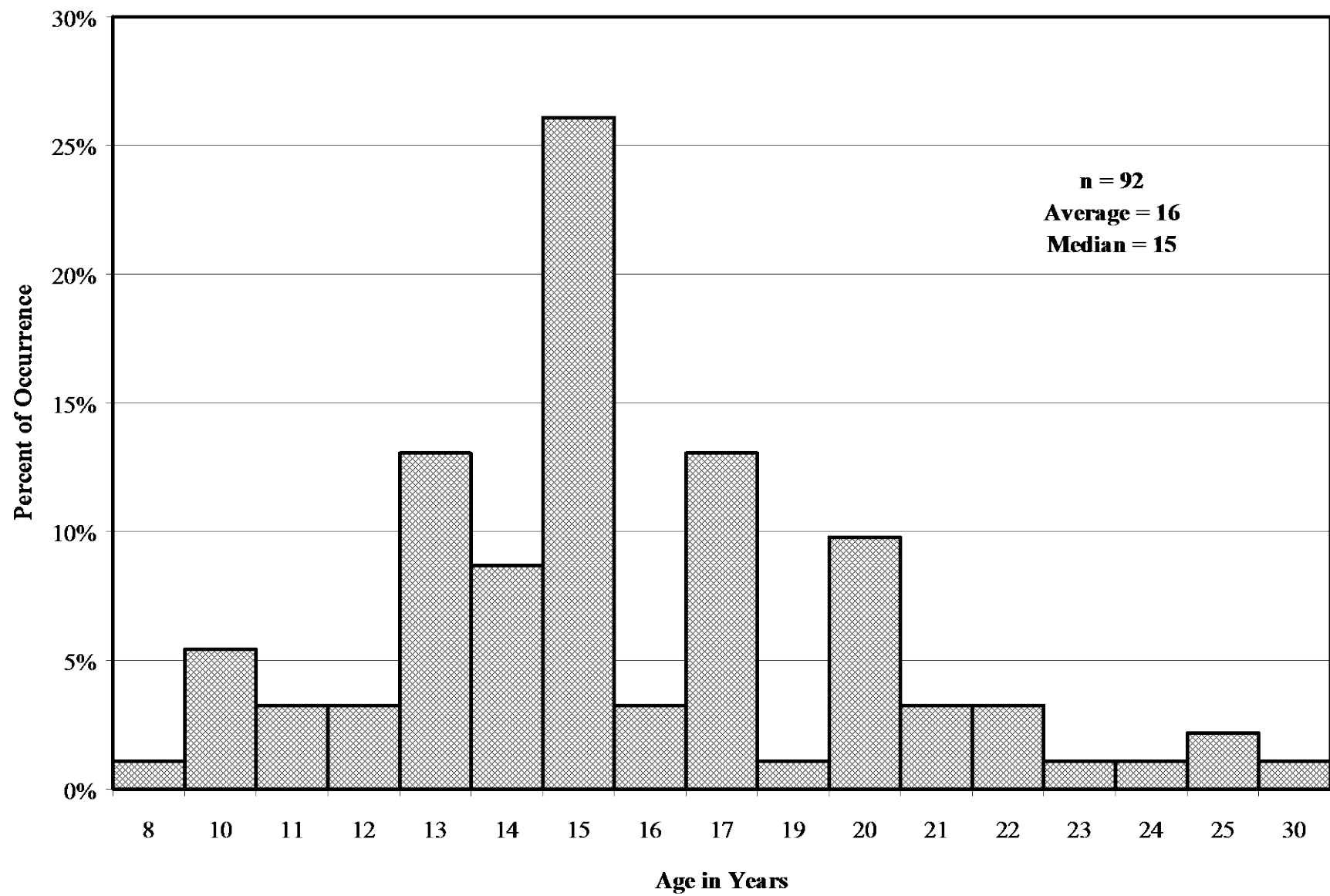


Figure 14. Histogram of the age of black rockfish sampled in Akutan in 1999 showing the average and median age.

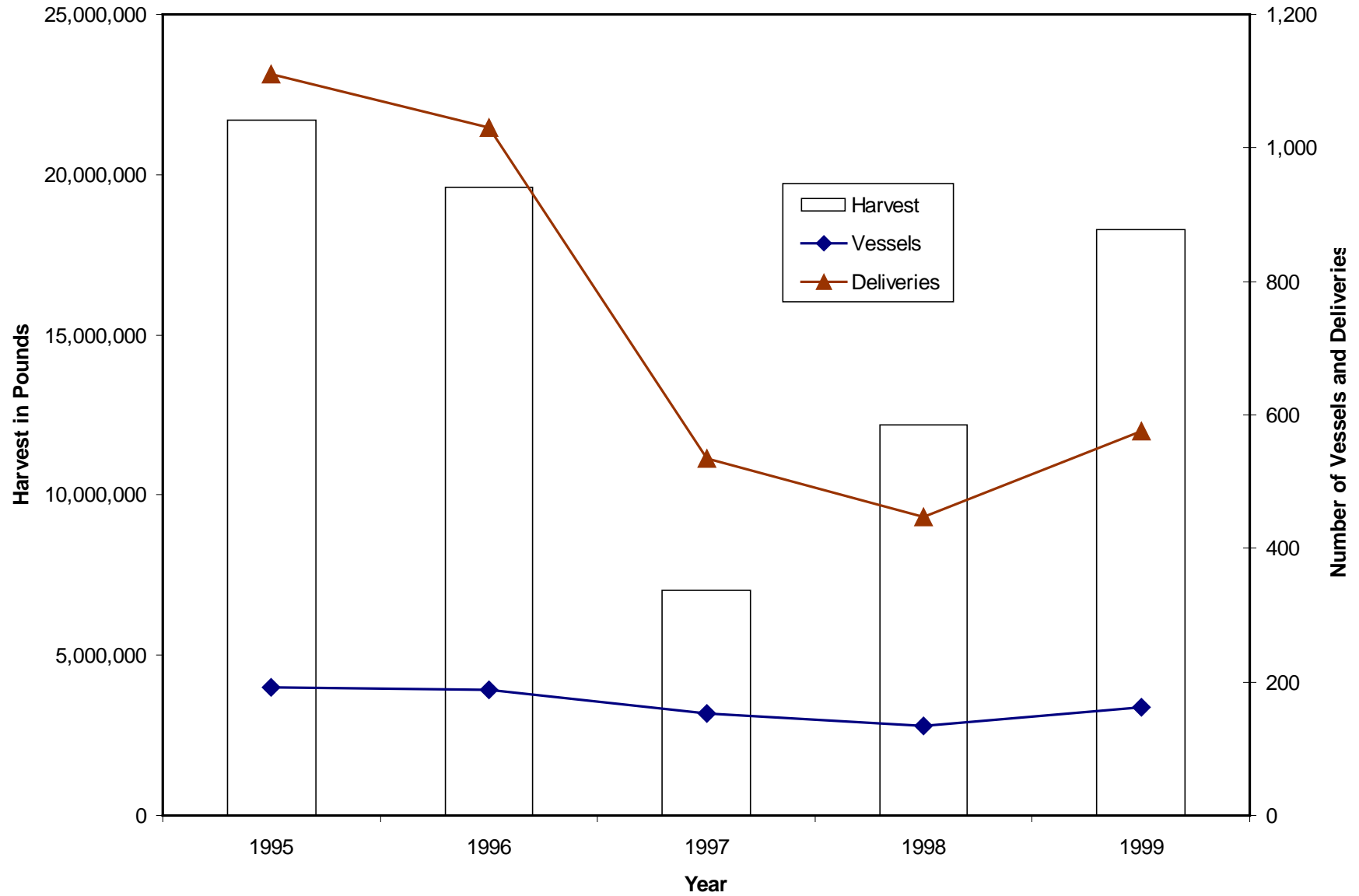


Figure 15. Pacific cod harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.



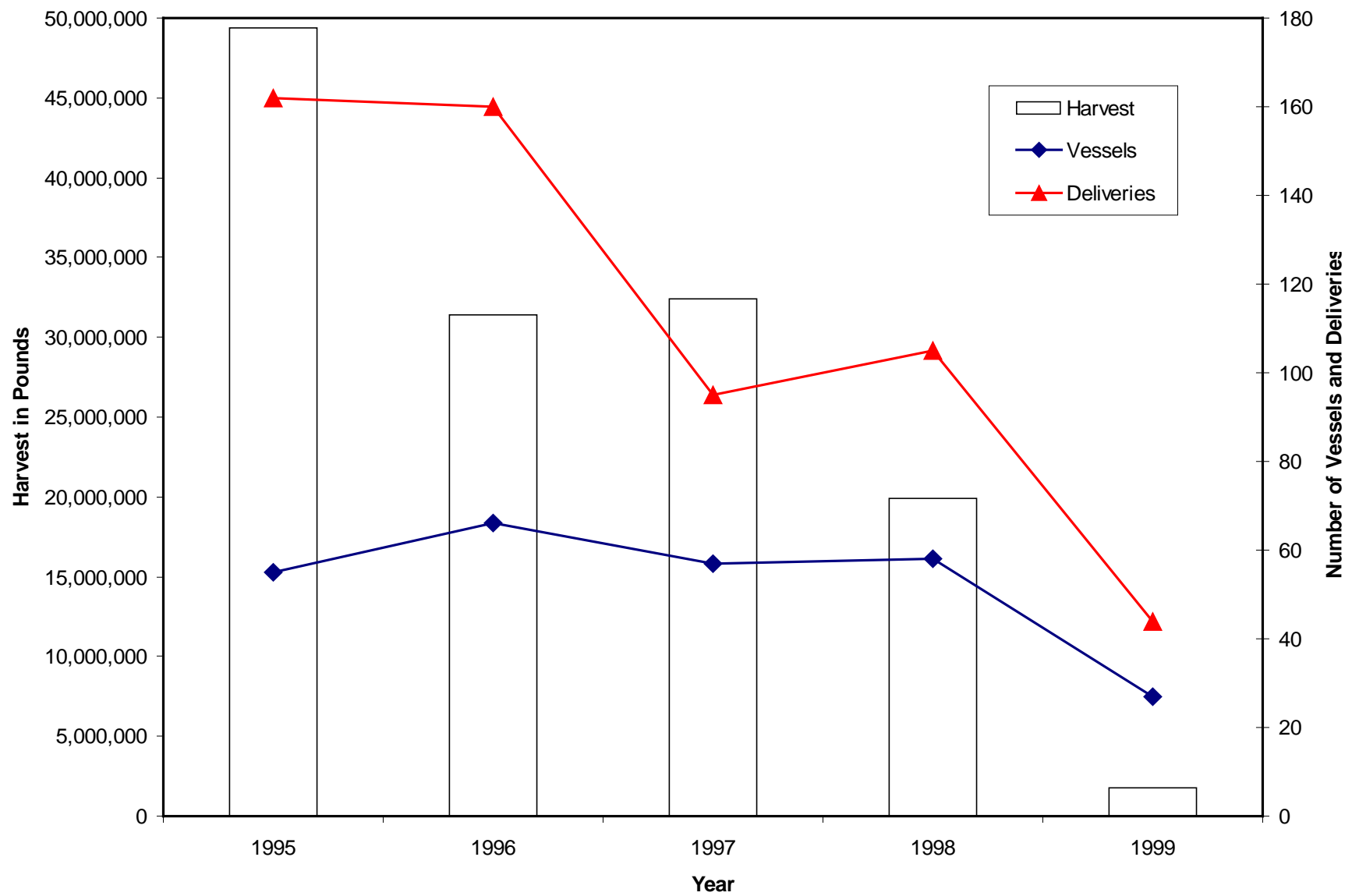


Figure 16. Walleye pollock harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

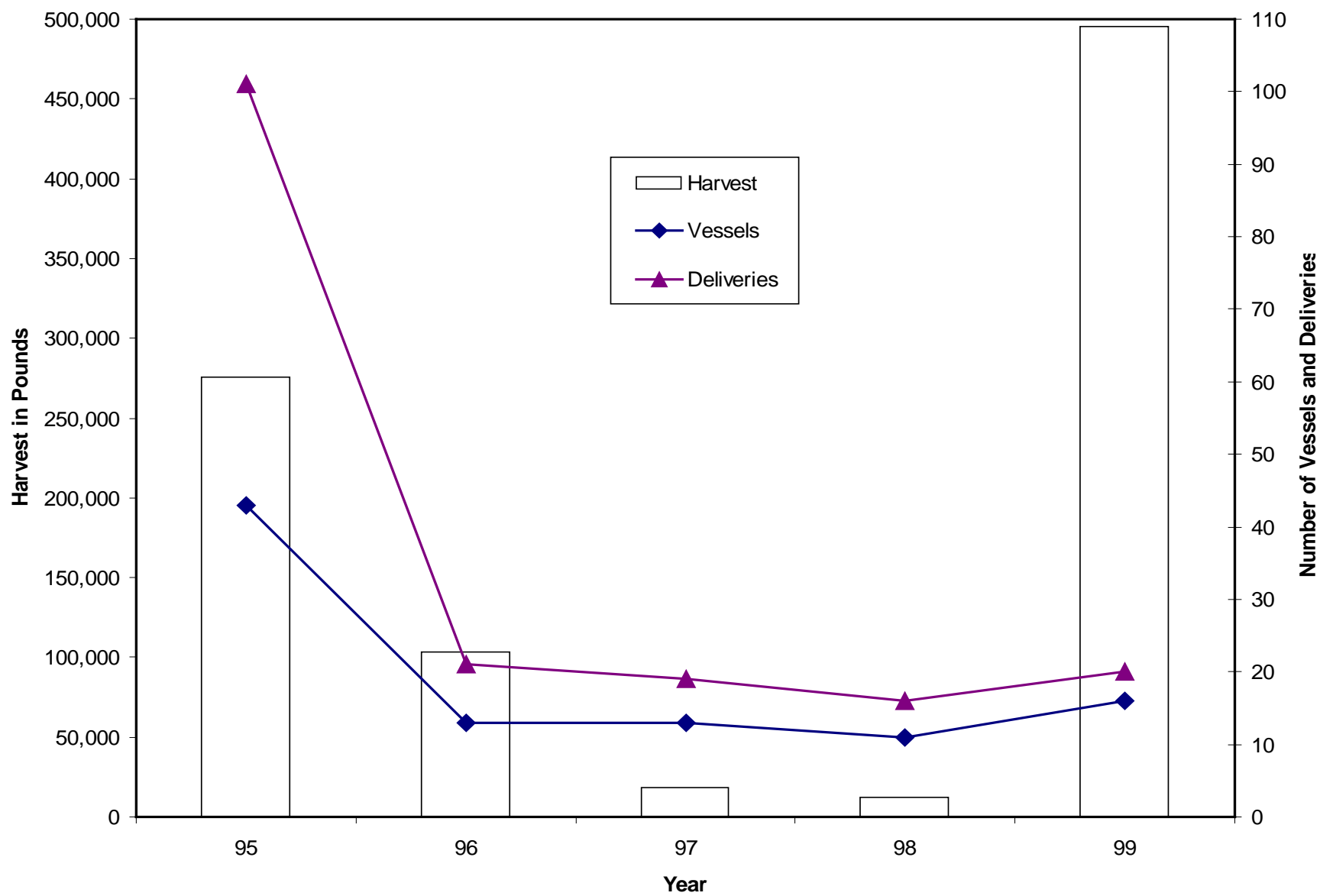


Figure 17. Atka mackerel harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

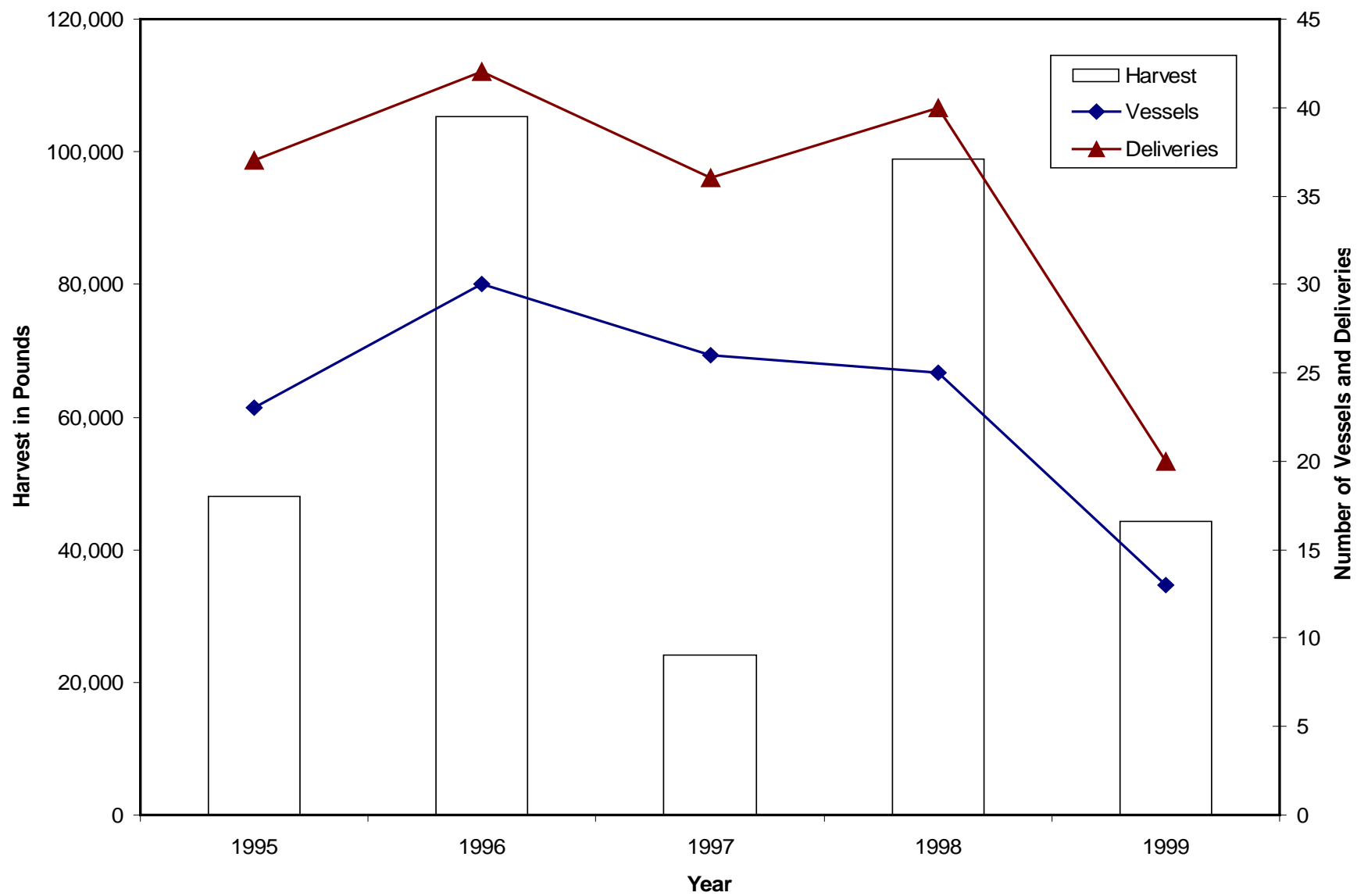


Figure 18. Pacific ocean perch harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

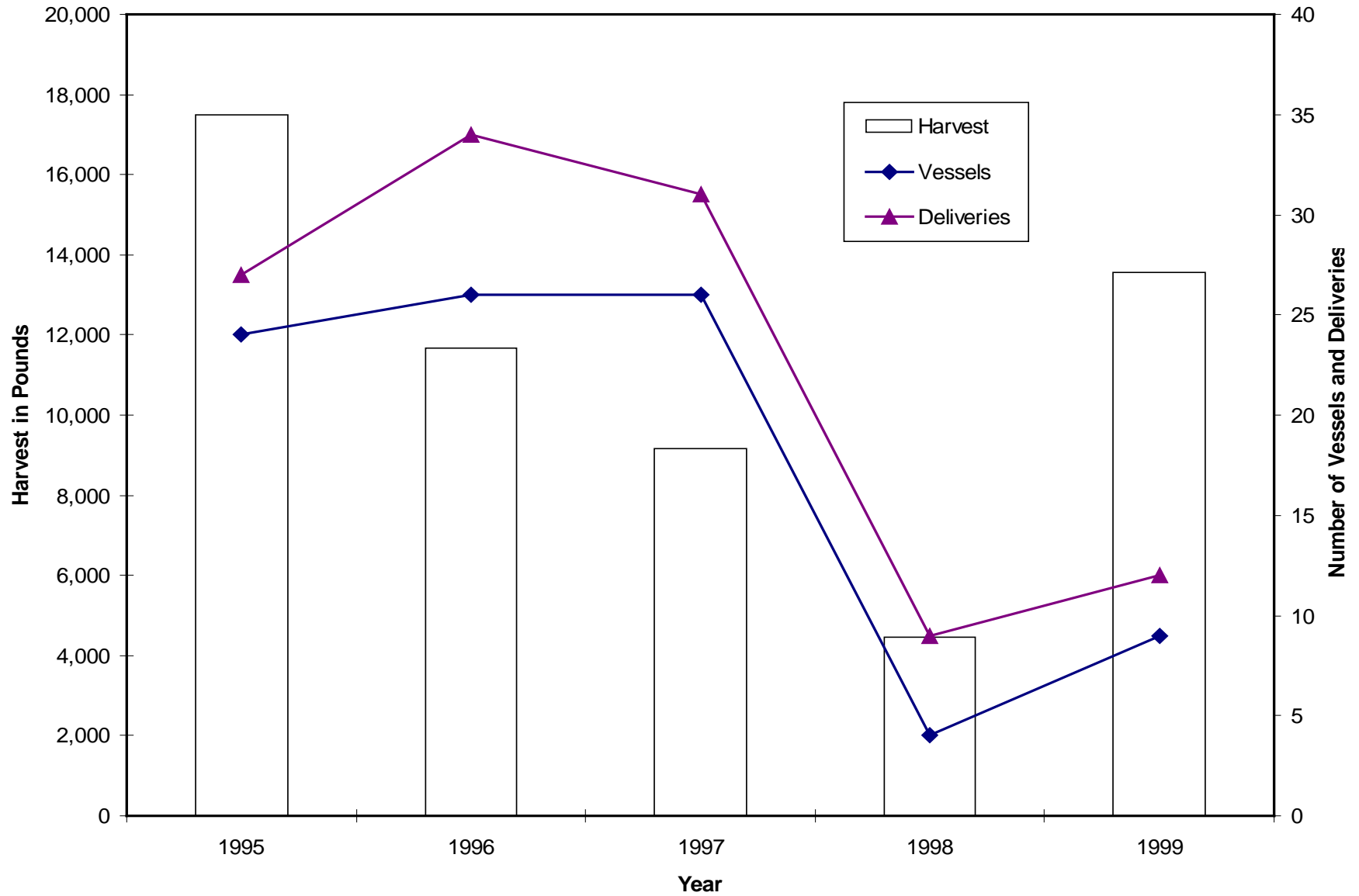


Figure 19. Shortraker and rougheye rockfish harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

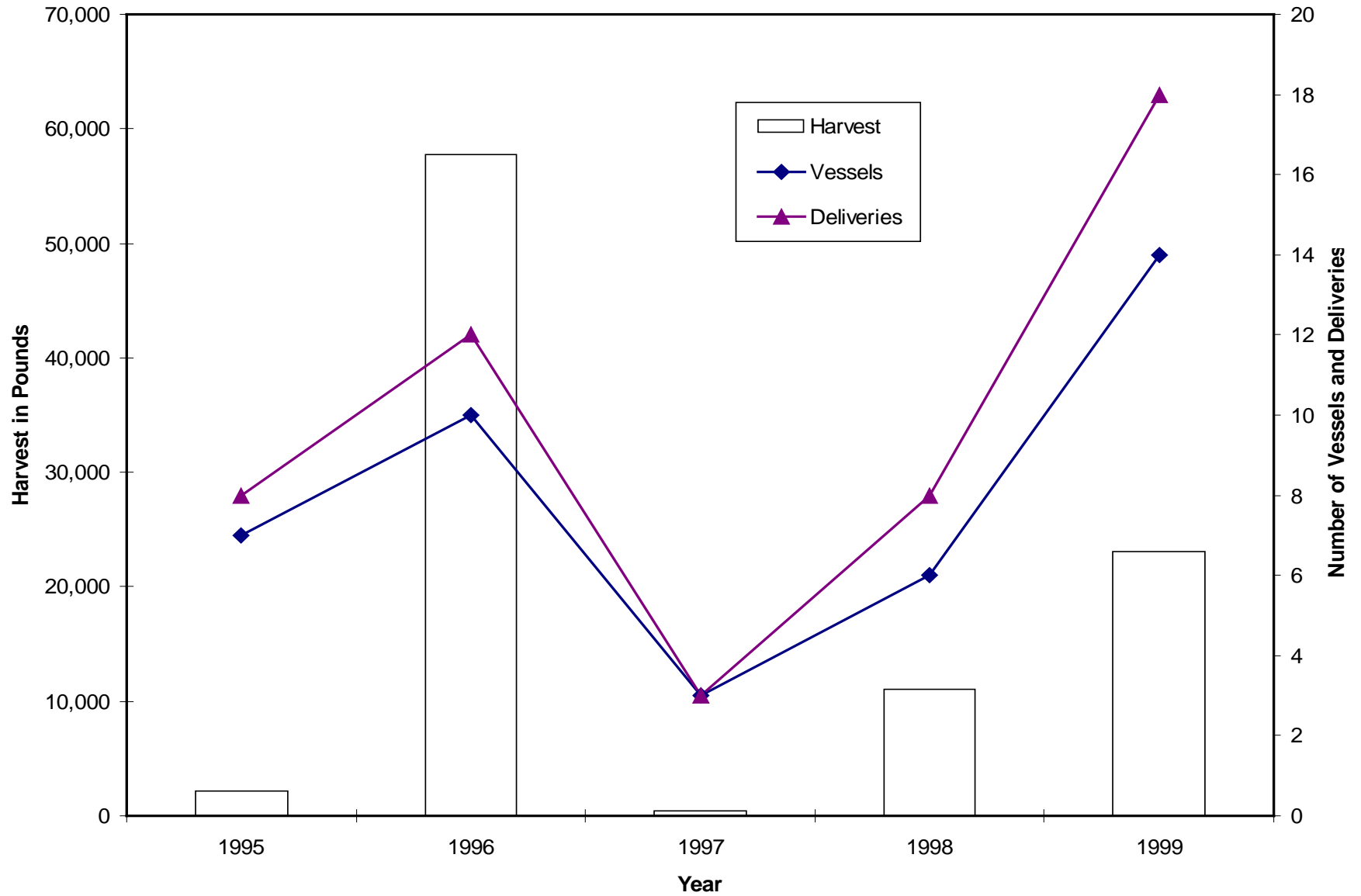


Figure 20. Sharpchin and northern rockfish harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

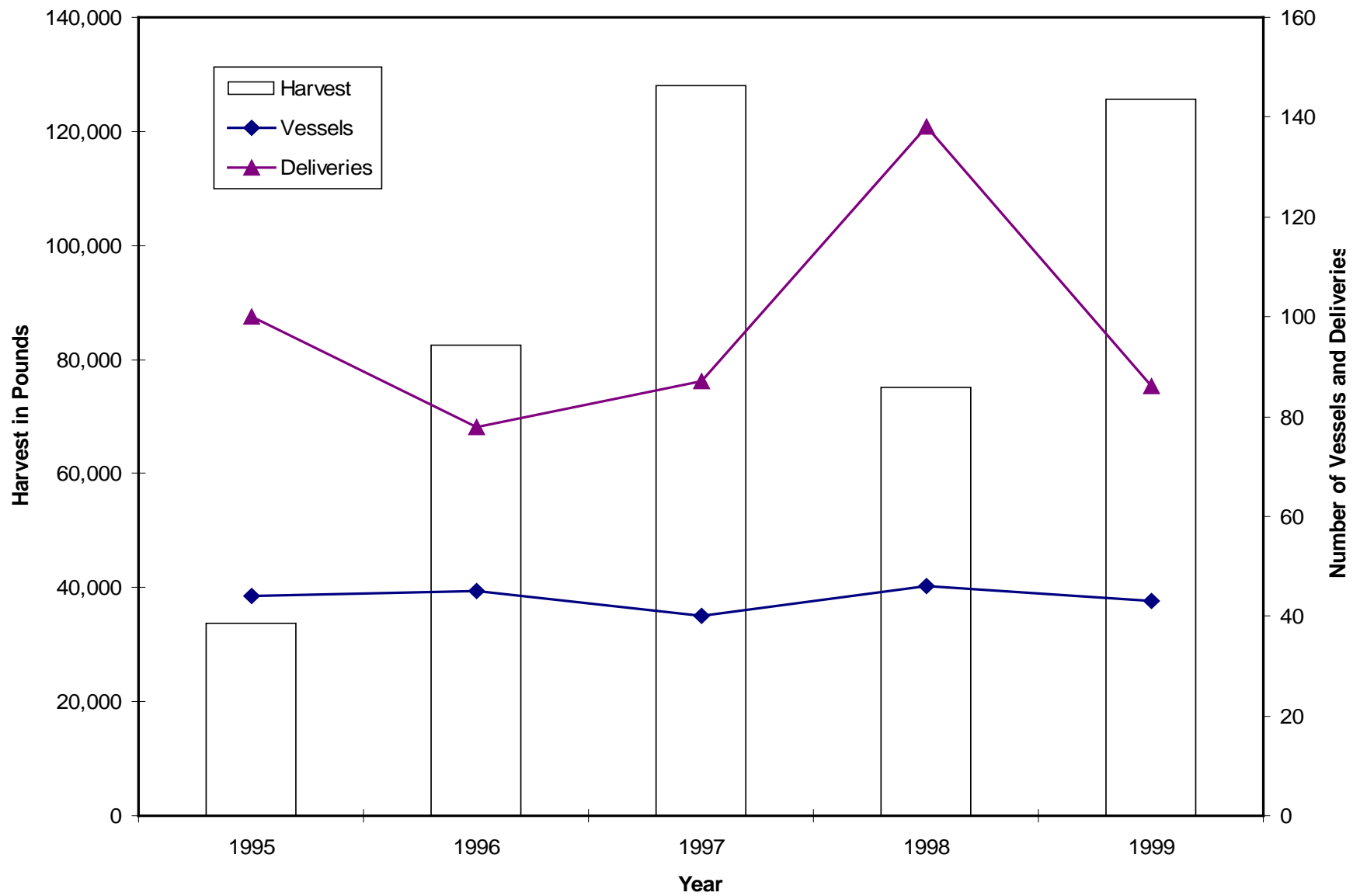


Figure 21. Other rockfish species complex harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

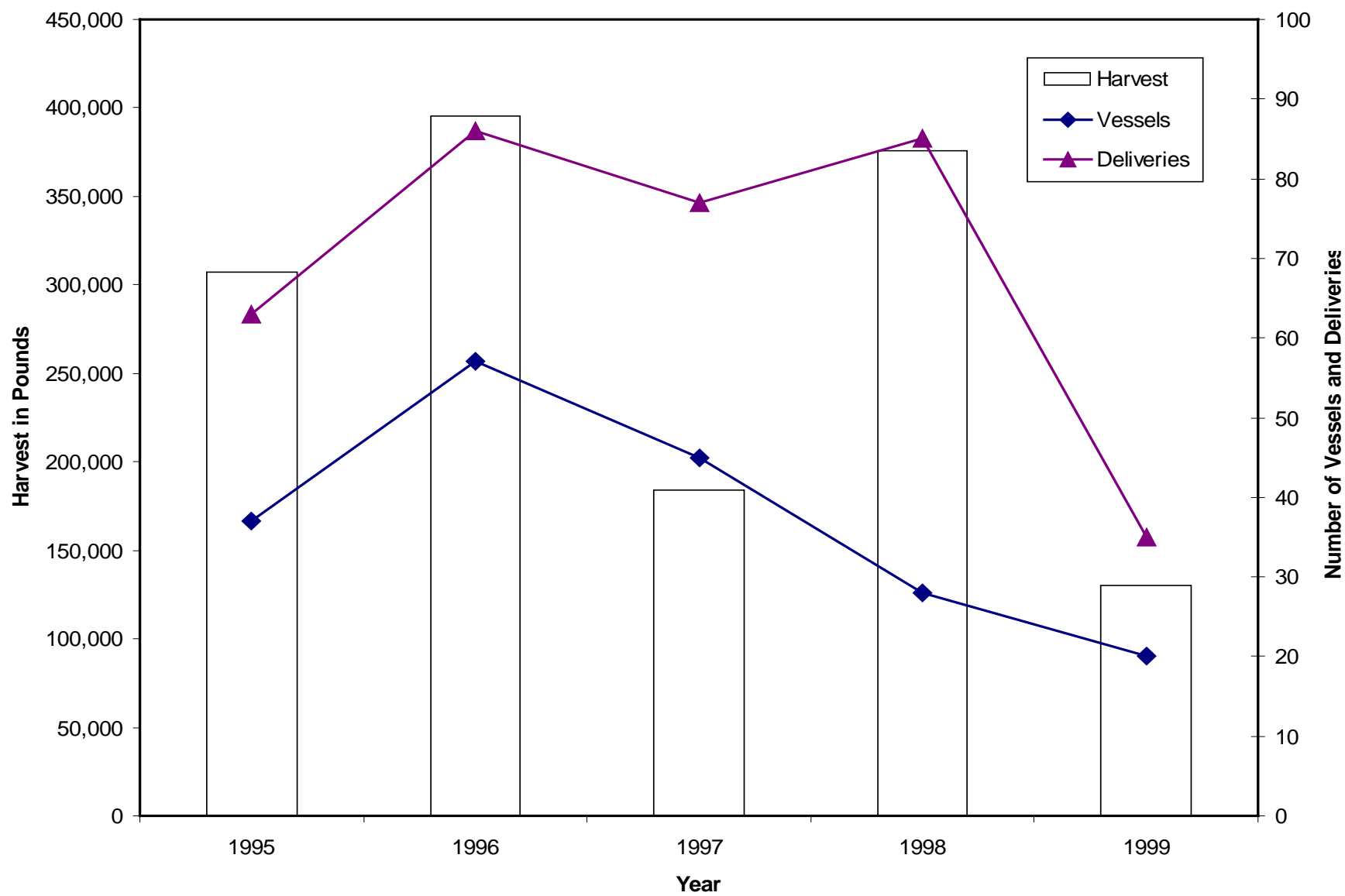


Figure 22. Greenland turbot harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

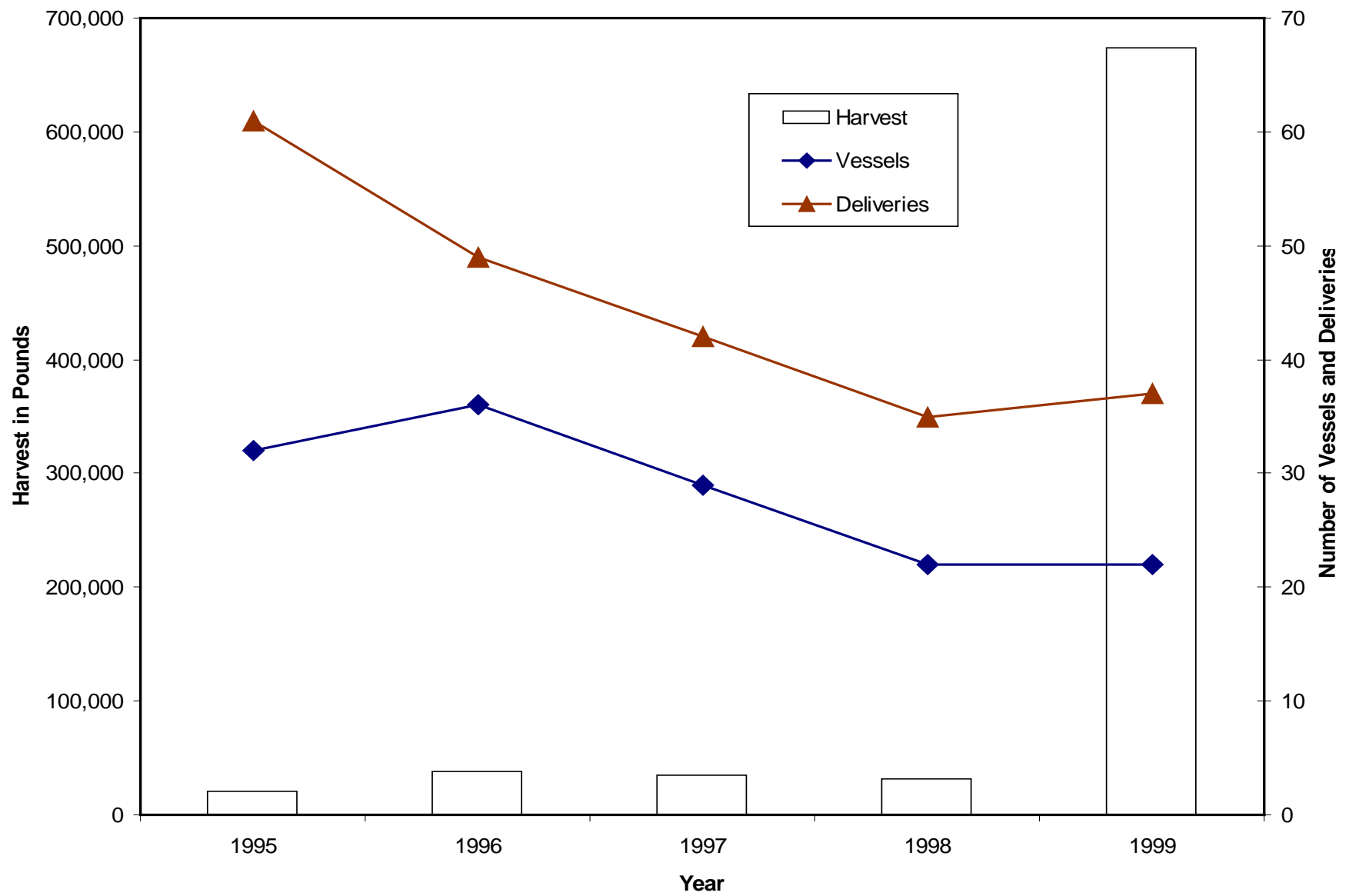


Figure 23. Arrowtooth flounder harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.



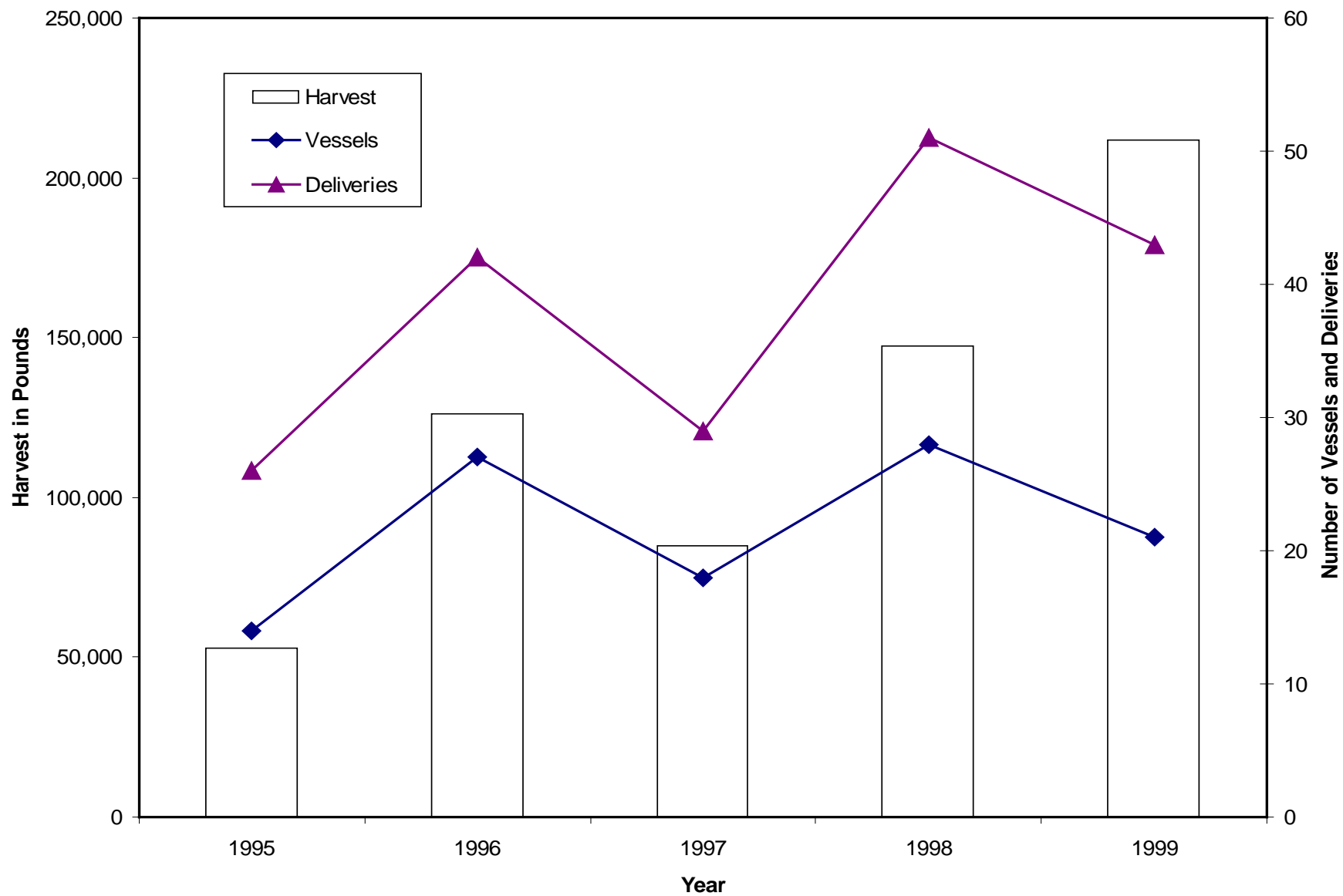


Figure 24. Rock sole harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

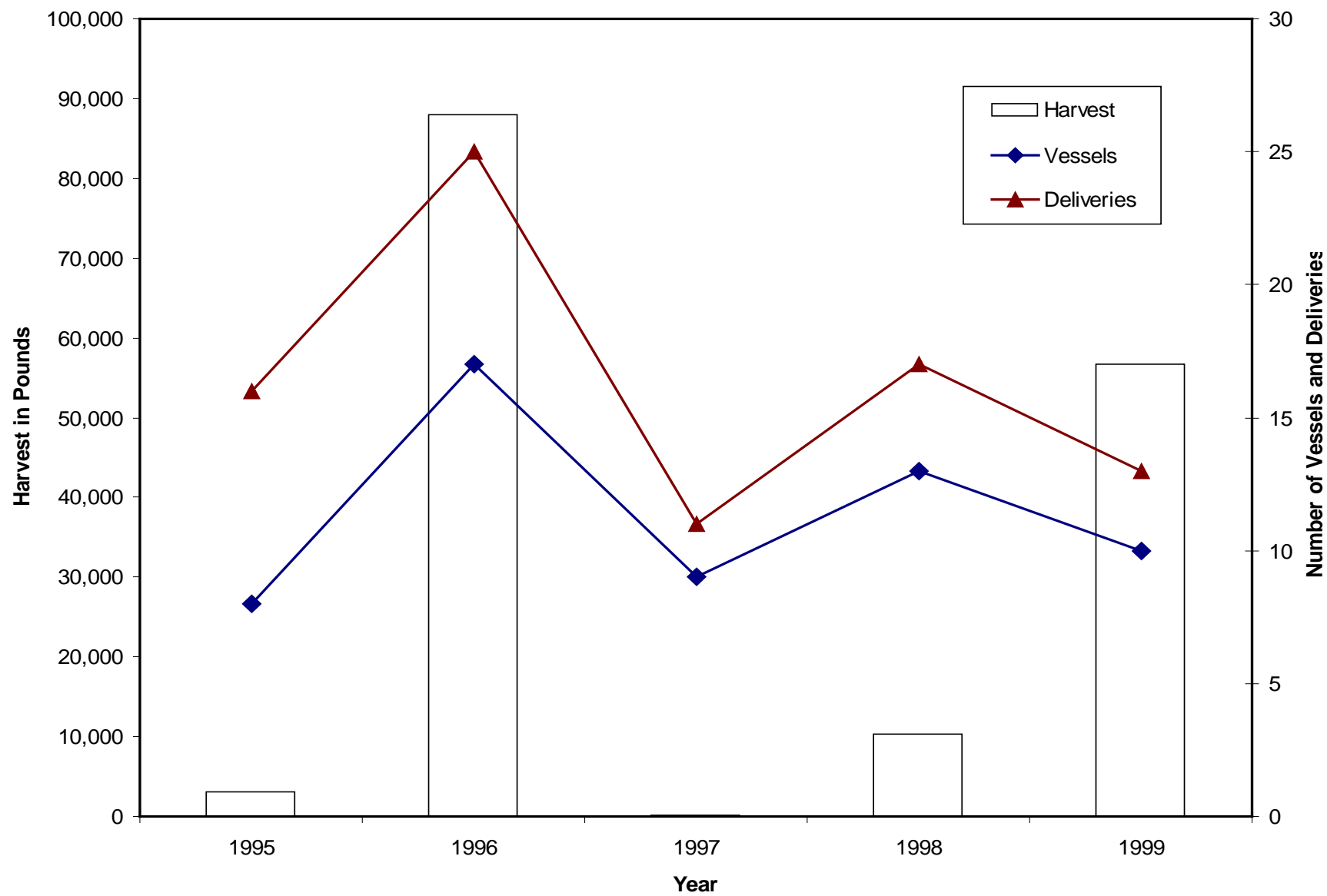


Figure 25. Yellowfin sole harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

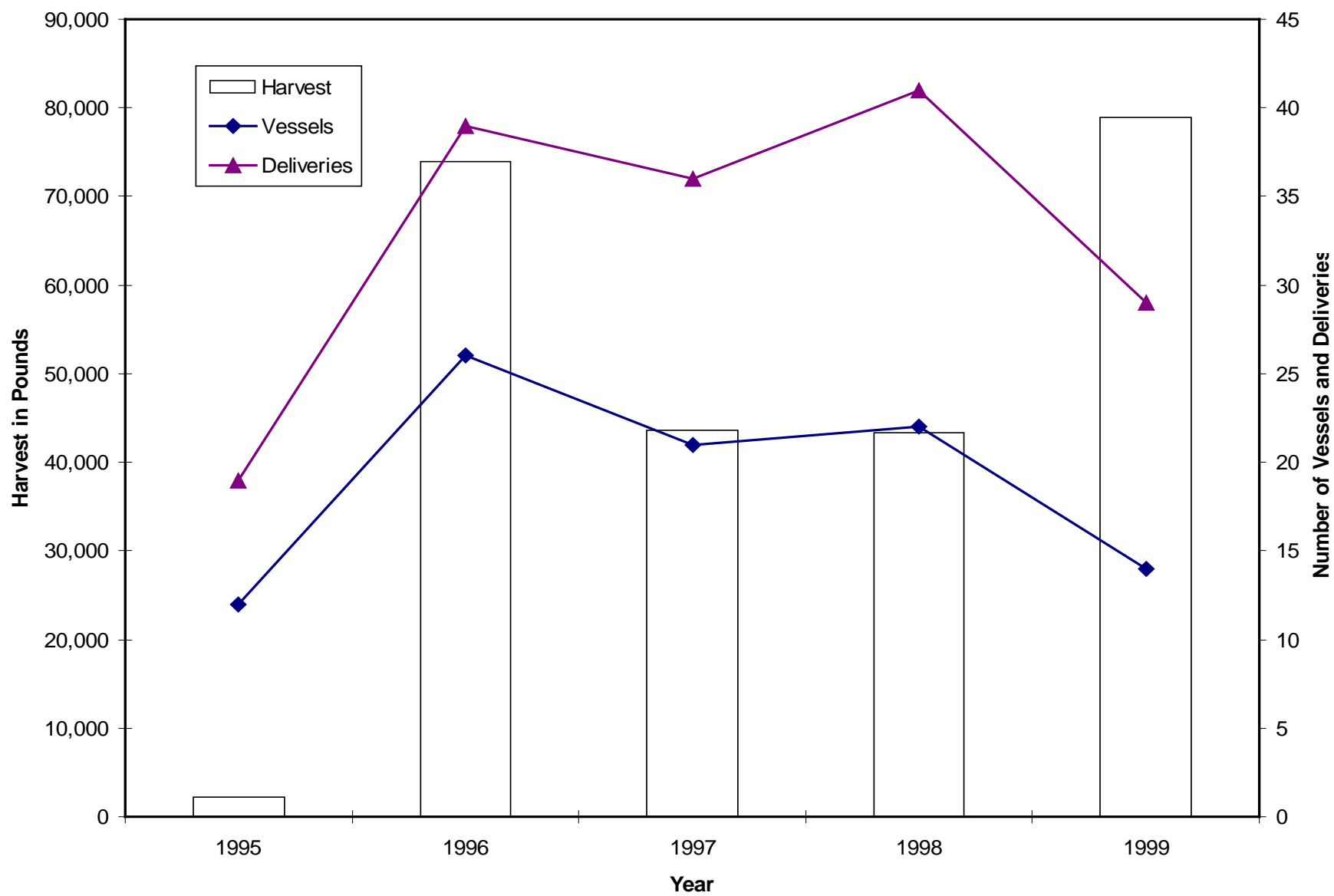


Figure 26. Flathead sole harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.

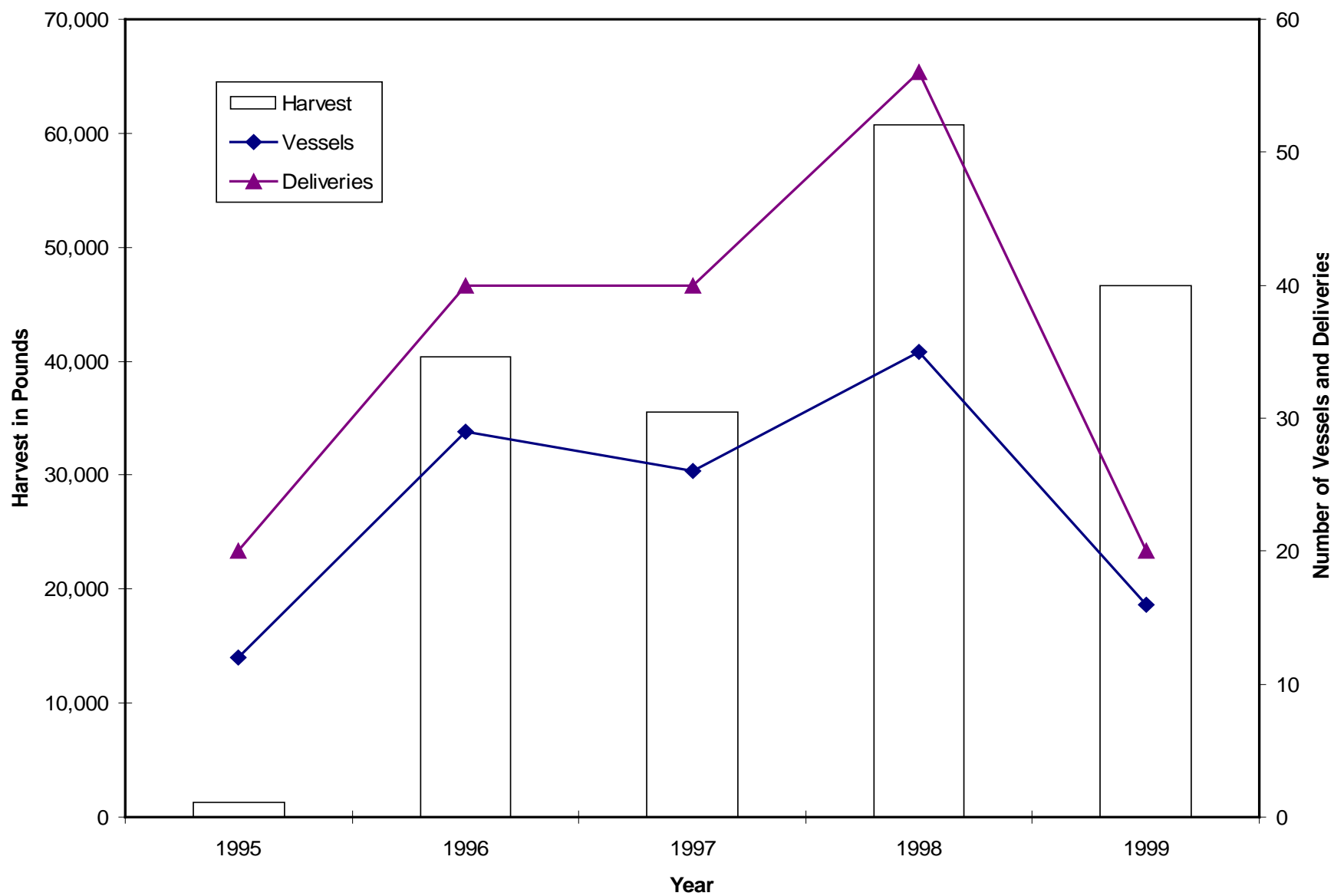


Figure 27. Other flatfish species complex harvest in state waters of the Bering Sea – Aleutian Islands Area, 1995 to 1999.